NETWORKED MENTORING TO PROMOTE SOCIAL BELONGING AMONG MINORITY DOCTOR OF PHYSICAL THERAPY STUDENTS

by
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Abstract

The physical therapy profession needs to increase the number of minority providers to meet the needs of an increasingly diverse U.S. population effectively. However, neither the student body nor faculty demographic adequately reflects the population, leading to the problem of practice: the underrepresentation of racial and ethnic minority faculty in physical therapy higher education in the U.S. As racial and ethnic minority Doctor of Physical Therapy students must reach critical mass at the entrance to the academic pipeline to feed the supply of racial and ethnic minority faculty, it is vital to understand the facilitators and barriers to minority student success. Racial and ethnic minority Doctor of Physical Therapy students report facing language and cultural barriers, as well as racial discrimination, and cite the lack of racially concordant mentors as barriers to success. The intervention was a networked mentoring program aligned with the racial/cultural identity development model. Mentoring teams consisted of a first-year minority student, a faculty mentor, and a second-year minority peer mentor to meet the student call for racially concordant mentorship. First-year mentees described feeling more connected to the institution through interactions with peer and faculty mentors in mentoring sessions and networking events. Faculty mentors demonstrated a significant increase in cross-cultural psychological capital throughout the six-month intervention period, and peer mentors articulated their professional growth through participating in the networked mentoring model. Additionally, peer mentors expressed an interest in seeking additional mentoring opportunities, highlighting the reciprocal benefits associated with mentoring.

Keywords: *physical therapy, student, faculty, racial and ethnic minority, mentoring*

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Dedication

This dissertation is dedicated to:

Tyler and Alex Wong and Aran and Kiyan Singh

And to the patients and students who deserve to find the doctors and mentors they have been searching for.

The Doctor I've been searching for

by Kamaria Washington PT/s (with permission)

She look like me

Like me

Look like we

She look like free

She look like we all free

She look like pride

Brown eyes, opened wide

She look like a woman in whom

I can confide

She look like legacy

White coat for robe

ID, her badge of honor

She look like majesty

She look like answered prayers

Confirmation that we could get somewhere

Like open doors

Barriers that been knocked down

She look like the young girls

from my side of town

She look like me

Like me

Look like we

She look like free

She look like we all free

Acknowledgments

In this dissertation, I used the ecological systems theory to frame how faculty, peers, and family guide minority students towards academic success, which has certainly been true for me. I could not have persevered in this doctoral journey without my strong microsystem of support!

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A crucial part of my microsystem is my family. My parents Krish and Savi, and my sisters Varini and Tess, role model perseverance and strong work ethic and provide unwavering support and belief that I will succeed in all my academic pursuits! Finally, to my husband, Kevin, and our sons Tyler and Alex – thank you for your patience and love.

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Executive Summary

In 2013, over 13 million Americans sought physical or occupational therapy services in an ambulatory care setting. While the average outpatient therapy patient is a White adult female, from a middle-high income household, there has been a steady growth in the number of African Americans, Asians, and low-income household patients seeking care. Notably, the period between 2009 and 2013 saw a 45% increase in the number of African Americans attending ambulatory therapy (Sandstrom, 2017). It is evident that an increasingly racially and ethnically diverse U.S. population (U.S. Census Bureau, 2017) drives the need for a diverse healthcare workforce to meet population needs (Grumbach & Mendoza, 2008). Enhanced health care provider diversity has the potential to impact health disparities among minorities as racial concordance between patient and health care provider is associated with increased patient participation in the care process, greater adherence to treatment, and higher patient satisfaction (U.S. Department of Health and Human Services, 2006).

The physical therapy (PT) profession fails to reflect the diverse patient population it serves. In 2016, the American Physical Therapy Association (APTA) workforce data on its members revealed a profession that was 89% White and 70% female (APTA Workforce Data, 2016). Despite efforts to diversify the health sciences student body through holistic admissions procedures (Snyder, Frogner, & Skillman, 2018; Wise et al., 2017), the representation of racial and ethnic minority (REM) students in Doctor of Physical Therapy (DPT) programs has remained stagnant over the last decade (CAPTE, 2019). Further, once enrolled in a DPT program, REM students are at increased risk of academic difficulty (Utzman, Riddle, & Jewell, 2007a) and failing the national PT examination (Utzman, Riddle, & Jewell, 2007b). Even after controlling for age, gender, and socioeconomic status (SES), REM students have a lower chance

of degree attainment than White students enrolled in PT programs (Williams, Norris, Cassidy, Naylor, Marston, & Shiers, 2015).

Problem of Practice

The purely quantitative nature of PT program outcome studies limits the ability to ascertain the cause of REM student challenges (Utzman et al., 2007a; Utzman et al., 2007b; Williams et al., 2015). One potential reason could center around the shortage of racially and ethnically diverse physical therapy faculty. REM students in the health sciences report that faculty are vital to their success (Zell, 2014), and express the need for racially concordant mentors who can appreciate their unique experience within racialized academic institutions (Daniel, 2007; Sanchez, Poll-Hunter, Stern, Garcia, & Brewster, 2016; Yehia et al., 2014). However, REM faculty continue to be underrepresented in PT higher education (CAPTE, 2017). In the 2018-2019 academic year, 86% of core faculty (n=2,350), and 84% of the associated faculty (n=2,162), teaching in accredited DPT programs in the U.S. self-reported as White (CAPTE, 2019). The problem of practice is the underrepresentation of racial and ethnic minority faculty in physical therapy higher education in the U.S.

Background and Context

To practice as a physical therapist in the U.S., students must graduate from an accredited PT program and pass a licensure exam. In 2018, there were 242 accredited DPT programs and 26 developing programs in the U.S. The site for this empirical study is a graduate school with entry-level and post-professional programs in physical therapy, occupational therapy, physician assistant studies, speech-language pathology, nursing, and genetic counseling. At the time of this study, the DPT program included 208 graduate students, supported by 22 core faculty members who self-identified as White (n=19) or Asian (n=3).

Needs Assessment

The purpose of the needs assessment was to explore REM DPT students' and graduates' definition of success and their perceived facilitators and barriers to success. The study used a mixed methods explanatory sequential design to analyze pre-existing performance data from four cohorts of DPT students who graduated from one program between 2014–2018 and pre-existing qualitative data from a campus climate survey and graduate exit surveys. Primary data sources included an online survey exploring DPT students' perceptions of mentoring and focus group interviews. The researcher interviewed fifteen REM students and graduates to explore perceived facilitators and barriers to success.

Over four years, most students were successful in degree attainment; however, race was significantly associated with increased incidences of academic difficulty ($p=0.03$) and increased time to degree attainment ($p=0.03$). Four percent of REM students withdrew from the program compared with less than one percent of White students. Campus climate and graduate exit survey data revealed respect for faculty, who were described as supportive of student success. Peers were perceived as less supportive and understanding of diverse perspectives than faculty. Students were aware of academic advising services but admitted to under-utilizing this option. Additionally, students expressed an appreciation for the somewhat diverse campus climate but felt that the institution was not as diverse as it claimed to be. Analysis of focus group data supported findings of secondary data analysis. REM students and graduates perceived facilitators to success included authentic interactions with faculty and minority peers. Barriers to success included language and cultural and social isolation, as well as discrimination, and a lack of representation of minorities both in the academic institution and clinical facilities. Despite barriers to success, REM students prioritized increasing access to care for communities of color

by providing bilingual patient care, highlighting REM DPT students as assets to the health care workforce. However, findings confirmed inequitable outcomes for REM students. Insight is offered into the experience of REM DPT students in a predominantly White institution. The shortage of minority role models highlights the need for minority core and clinical faculty.

Theoretical Framework

Community cultural wealth (Yosso, 2005) and the racial/cultural identity development (R/CID) model (Sue & Sue, 2012) frame the intervention. Yosso (2005) challenges the view that racial and ethnic minority persons lack the social and cultural capital needed for success. Community cultural wealth posits that families and communities play a central role in the lives of minority students and includes the forms of capital (aspirational, navigational, social, resistant, familial, and linguistic) which REM students bring from their communities into the classroom (Yosso, 2005). The R/CID model conceptualizes REM persons on a development continuum as they seek to understand themselves and their culture in relation to the dominant culture and describes the development of the minority person towards a state of acceptance of their racial/cultural identity (Sue & Sue, 2012). In higher education, the R/CID model may be useful when considering the mentoring students of racial/ethnic minority backgrounds.

Interventions

The literature review explored interventions to support REM students enrolled in an academically rigorous DPT program. Primary drivers to improve academic performance included interventions related to language and dialects, scaffolding the didactic program, developing a culturally responsive DPT curriculum, and mitigating stereotype threat through faculty, staff, and student training. Ultimately, secondary drivers formed the focus of the literature review as the critical levers for productive change. The researcher focused on the link between social

belonging and academic achievement and promoting student social and academic integration through mentorship.

Students of color report that interacting with faculty mentors of color helps introduce them to the unwritten norms and rules of the profession, role-models effective professional behavior, and improves their social capital by introducing them to a significantly different network (Davis, 2007). Quality relationships with fellow students can also foster social integration and contribute to academic persistence and success (Fullick et al., 2012; Tinto, 1993; Walton et al., 2012; Yomtov et al., 2017). As increasing student, peer, and faculty contact is vital to increasing social and academic integration of minority students in higher education (Tinto, 1993), the intervention comprised a networked mentoring program for first-year REM DPT students, aligned with R/CID (Sue & Sue, 2012).

Research Purpose and Objective

The purpose of this study was to explore whether networked mentoring could mitigate social isolation and promote social belonging for first-year REM DPT students and develop cross-cultural psychological capital among a group of mostly White DPT faculty mentors. In addition, the study explored how second-year minority peer mentors guided DPT faculty to meet the unique mentoring needs of minority students and whether participation in the program contributed to professional socialization among second-year REM DPT students.

The following research questions in this study addressed both process and outcome evaluation:

RQ1: How has the study implementation adhered to or differed from the proposed implementation procedures?

RQ2: To what extent does a networked mentoring model mitigate social isolation for first-year REM DPT students?

RQ3: To what extent does a networked mentoring model foster sense of belonging for first-year REM DPT students?

RQ4: How does participation in a networked mentoring model contribute to DPT faculty's cross-cultural psychological capital?

RQ5: How do REM DPT peer mentors guide faculty to meet the unique mentoring needs of first-year REM DPT students?

RQ6: How does participation in a networked mentoring program contribute to second-year REM DPT students' socialization into the physical therapy profession?

Research Design

This study utilized a quasi-experimental mixed methods (explanatory sequential) design (Leech & Onweugbuzie, 2009; Shadish, Cook, & Campbell, 2002) with a first-year mentee treatment group and comparison group, and faculty treatment and comparison groups. This study leveraged a mixed methods approach in the following components: (a) the research objectives included both prediction and exploration, (b) the type of data collected included both quantitative (through use of the College Experience Questionnaire and the Cross-Cultural Psychological Capital Survey) and qualitative (using open-ended survey questions and focus group interviews), and (c) analysis included both statistical analysis of survey data and thematic analysis of interview data and open-ended survey responses.

Intervention

Eight first-year students supported by eight second-year peer mentors and six faculty mentors consented into the networked mentoring program. In addition, six faculty and one first-

year DPT student consented into respective comparison groups. The first-year intervention group included four female and four male students, who self-identified as African-American/Black (n=2), Asian/Pacific Islander (n=3), Hispanic (n=2), or mixed-race (n=1). A first-year REM student, minority peer mentor, and faculty mentor formed a mentoring team. The first month of the intervention was dedicated to faculty, and peer mentor professional development (PD). In addition to online PD modules, faculty and peer mentors formed professional learning communities and met in person and online to refine cross-cultural mentoring strategies. Peer mentors also met with faculty to advocate for minority students and to guide faculty towards meeting the unique needs of minority students. In addition to faculty and peer mentoring sessions, study participants attended two networking events. The first networking event focused on service-learning opportunities in Guatemala and Jordan, and the second focused on post-graduate opportunities and included a panel of interprofessional alumni and minority faculty.

Data and Data Analysis

Quantitative data collected included first-year intervention and comparison group scores on the College Experience Questionnaire (CEQ; Spivey-Mooring & Apprey, 2014) administered at the beginning and end of the study period. Faculty in the intervention and comparison groups completed the Cross-Cultural Psychological Capital survey (Cross-cultural PsyCap; Dollwet & Reichard, 2014) at the mid and end study points. In addition, first and second-year students completed mid and end of study surveys to track the dosage of the intervention delivered and received. At the end of the study period, mentees, peer mentors, and faculty mentors participated in focus group interviews with the researcher. Descriptive statistical analysis and inferential statistics followed quantitative data collection. The researcher used the six-step process for

thematic analysis identified by Braun and Clarke (2006) to analyze focus group interview data and responses to open-ended survey questions.

Findings

First-year mentees reported receiving an average of 6.63 faculty mentoring sessions, 5.88 peer mentoring sessions, and all participants attended at least one of the networking events. Early data collection, campus closure to the COVID-19 global pandemic, and the rapid shift to online learning contributed to the lower than expected received mentoring sessions. However, all first-year mentees agreed or strongly agreed that they received the critical elements of mentoring during the study period. Faculty and peer mentors met an average of twice over the intervention period.

Descriptive statistics on the CEQ scores at baseline revealed lower scores for the intervention group on the university connectedness and environment subscales and slightly higher scores on the university alienation subscale compared with the participant in the comparison group. While first-year REM DPT students did not describe feeling alienated at the institution, they described challenges navigating the foreign culture of graduate school. Additionally, participants noted a shortage of minority role models at the institution, particularly faculty of color. Over the study period, the intervention group demonstrated small increases in scores on the university connectedness and university environment subscales on the CEQ. However, intervention group scores remained lower than the student in the comparison group on both subscales. Participants described feeling more connected to the institution through interactions with peer and faculty mentors in mentoring sessions and networking events and described the importance of having mentors of color. Participants also expressed valuing peer mentors who had successfully navigated through the first year of the DPT program. Networking

events introduced mentees to graduates of the institution who had persevered, reinforcing positive feelings about the institution.

Analysis of the Cross-Cultural PsyCap data revealed that faculty in the intervention group presented with lower cross-cultural psychological capital than peers in the comparison group at baseline. However, faculty who participated in the intervention demonstrated a significant increase in their cross-cultural psychological capital at the end of the study period ($p=0.046$). There was no significant change in comparison group scores ($p=0.854$). Analysis of qualitative data revealed that faculty mentors leveraged specific steps to nurture the mentoring relationship, including dedicating enough time for mentoring, considering physical spaces, non-verbal communication, and preparation. Vulnerability was also seen as a pre-requisite to a successful mentoring relationship and set mentors up for increasing their cross-cultural awareness. Responsiveness was also noted as valuable to establishing the relationship. Ultimately, faculty mentors in this study gained an increased awareness of the unique barriers facing minority students, which may also serve as barriers to intake in the classroom.

Second-year DPT peer mentors described their professional growth during their time as graduate students and actively working to create a community with peers and faculty. Second year DPT students designed social networks needed to succeed. Mentoring as a two-way street was highlighted by peer mentors who articulated their professional growth through participating in the networked mentoring model. Mentors felt empowered hearing from minority leaders in networking events and grew confident in their ability to mentor others through observing their mentees' professional growth. While the second-year students served as peer mentors in this study, their need for mentorship was also evident. Peer mentors described having an enhanced understanding of the faculty role and, while their motivation to pursue an academic career did

not change, mentors described planning to seek out future mentoring opportunities. Through participating in the mentoring program, peer mentors appeared to gain confidence as they looked ahead to becoming Doctors of Physical Therapy.

Chapter 1: Overview and Factors Related to the Problem of Practice

In 2013, over 13 million Americans sought physical or occupational therapy services in an ambulatory care setting. While the average outpatient therapy client is a White adult female, from a middle-high income household, there has been a steady growth in the number of African Americans, Asians, and low-income household patients seeking care. Notably, the period between 2009 and 2013 saw a 45% increase in the number of African Americans attending ambulatory therapy (Sandstrom, 2017). By 2044 more than half of all Americans are projected to belong to a racial or ethnic minority group (U.S. Census Bureau, 2017), driving the need for a diverse healthcare workforce to meet population needs (Grumbach & Mendoza, 2008). Enhanced health care provider diversity has the potential to impact health disparities among minorities as racial concordance between patient and health care provider is associated with increased patient participation in the care process, greater adherence to treatment, and higher patient satisfaction (U.S. Department of Health and Human Services, 2006). These findings are particularly relevant to physical therapy care, which relies heavily on collaborative decision making between patient and therapist. However, the physical therapy (PT) profession fails to reflect the diverse patient population it serves. In 2016, the American Physical Therapy Association (APTA) workforce data on its members revealed a profession that was 89% White and 70% female (APTA Workforce Data, 2016).

One of the elements of the APTA's Vision Statement for the Physical Therapy Profession in 2020 is *Practitioner of Choice,* which describes physical therapists as preferred providers to restore function and health (APTA Vision 2020, 2015). The patient should also be able to select a racially concordant provider, should they choose. *Direct Access* is a second element of the vision statement describing consumer right to physical therapy (APTA Vision 2020, 2015). As minority

healthcare providers are more likely to serve in minority and medically underserved communities (Odom, Roberts, Johnson, & Cooper, 2007), increasing racial and ethnic diversity of the PT workforce may make strides towards addressing the vision of direct access.

Despite efforts to diversify the health sciences student body through holistic admissions procedures (Snyder et al., 2018; Wise et al., 2017), the representation of racial and ethnic minority (REM) students in Doctor of Physical Therapy (DPT) programs has remained stagnant over the last decade (CAPTE, 2019). Of the approximately 34,000 students enrolled in accredited DPT programs throughout the U.S during the 2018-2019 academic year, 74.6% self-reported as White, 3.4% as African American/Black, and 6.5% as Hispanic (CAPTE, 2019). This representation fails to adequately reflect a U.S. population which in 2019 was 13.4% African American/Black, and 18.3% Hispanic (U.S. Census Bureau, 2019). Further, once enrolled in a DPT program, REM students are at increased risk of academic difficulty (Utzman, Riddle, & Jewell, 2007a) and failing the national PT examination (Utzman, Riddle, & Jewell, 2007b). Even after controlling for age, gender, and socioeconomic status (SES), REM students have a lower chance of degree attainment than White students enrolled in PT programs (Williams, Norris, Cassidy, Naylor, Marston, & Shiers, 2015).

Problem of Practice

The purely quantitative nature of PT program outcome studies limits the ability to ascertain the cause of REM student challenges or offer insight into strategies to retain minority PT students (Utzman et al., 2007a; Utzman et al., 2007b; Williams et al., 2015). There is the need for an examination of the lived experience of REM students to determine how minority students enrolled in DPT programs define success and how their needs may differ from their majority colleagues. One potential reason could center around the shortage of racially and ethnically

diverse physical therapy faculty. REM students in the health sciences report that faculty are vital to their success (Zell, 2014), and express the need for racially concordant mentors who can appreciate their unique experience within racialized academic institutions (Daniel, 2007; Sanchez, Poll-Hunter, Stern, Garcia, & Brewster, 2016; Yehia et al., 2014). However, REM faculty continue to be underrepresented in physical therapy (PT) higher education (CAPTE, 2017). In the 2016-2017 academic year, 84% of core faculty, and 85% of associated faculty, teaching in accredited physical therapy programs in the U.S self-reported as White (CAPTE, 2017). The problem of practice (POP) is the underrepresentation of racial and ethnic minority faculty in physical therapy higher education in the U.S.

Context of the Problem

DPT professional education refers to the didactic and clinical education that prepares graduates for entry into the practice of physical therapy. To practice as a physical therapist in the U.S., students must graduate from an accredited physical therapy program and pass a licensure exam. The DPT degree is typically a three-year graduate program and, in 2018, there were 242 accredited DPT programs and 26 developing programs in the U.S. The site for this empirical study is a graduate school with entry-level and post-professional programs in physical therapy, occupational therapy, physician assistant studies, speech-language pathology, nursing, and genetic counseling. At the time of the study, the DPT program included three cohorts making up a total of 208 graduate students, supported by 22 core faculty members who self-identify as White (n=19) or Asian (n=3).

Defining the Construct of Minority

An overarching construct that guided this study was minority status. The term minority is a challenging construct to define as it encompasses complex dimensions and is heavily

dependent on context (Goldmann, 2001). Minority, describing more than visual characteristics, can refer to ethnocultural and demographic characteristics, and socioeconomic status (Goldmann, 2001). The term minority may also be used to describe those individuals who do not have the opportunity to participate equitably in political, economic, or social spheres, thereby indicating a lack of size and power in relation to the dominant culture (Goldmann, 2001).

As the student body in higher education continues to diversify (Bransberger & Michelau, 2016), the definitions of minority and underrepresented may change (Allen-Ramdial & Campbell, 2014). The Association of American Medical Colleges defines underrepresented in medicine as those racial and ethnic groups whose representation in medicine does not reflect their numbers in the general population (Association of American Medical Colleges, 2020). In PT, underrepresented minority includes "those racial and ethnic populations that are underrepresented in the physical therapy profession relative to their numbers in the general population, as well as individuals from geographically underrepresented areas, lower economic strata, and educationally disadvantaged backgrounds" (Wise et al., 2017, p. 209). Both definitions allow for the change in the national demographic and speak to the need for the healthcare workforce to evolve accordingly (Wise et al., 2017). Within the context of this work, the term minority focuses on race and ethnicity and describes students and faculty of African American/Black, Hispanic, Native American, and Asian descent who have limited representation in physical therapy programs, either as faculty, students, or both (CAPTE, 2019).

Theoretical Frameworks

Two theoretical models frame this literature review and need assessment. The first is Bronfenbrenner's ecological systems theory (EST; Bronfenbrenner, 1994; Bronfenbrenner & Morris, 2006) used to conceptualize the POP within a nested model. Second, the academic

pipeline theory (Berryman, 1983) describes the movement of students along the academic pipeline from enrollment in a graduate or doctoral program to ultimately achieving a tenure track position (see Figure 1.1).

The purpose of this literature review was to highlight the unique challenges that REM students face at each stage of the academic pipeline and at each level of the ecological system from macro- to microsystem. REM student and faculty experience in a racialized academy are compared. This literature review will begin by exploring the chronosystem and broad societal factors at the macrosystem level and conclude by looking at the proximal processes at the microsystem level.

Additionally, the cognitive and constructivist perspectives help frame the challenges that REM students face in academically rigorous health sciences programs. Cognitive apprenticeship is a hallmark of physical therapy education; however, the lack of racially concordant mentors for REM students in the health sciences is apparent (CAPTE, 2017). Mentoring needs of REM students and faculty have been studied in nursing (Ackerman-Barger, Bakerjian, & Latimore, 2015; Salvucci & Lawless, 2016) and medicine (Julien et al., 2014; Yehia et al., 2014). However, there is a shortage of literature specific to the mentoring needs of REM students enrolled in DPT programs. The argument is made that further investigation into the mentoring needs of REM students is warranted.

The Academic Pipeline Theory

Blockages and leakages in the academic pipeline describe REM student and faculty attrition in health sciences (Hinton et al., 2010; Palatta, 2016), business school (Minefee, Rabelo, Stewart, & Young, 2018), and science, technology, engineering, and mathematics programs (STEM; Allen-Ramdial & Campbell, 2014). Pipeline blockages also capture the barriers that

faculty of color encounter attempting to progress up the ranks of the professoriate. Leakage (REM student attrition) tends to occur most frequently at the masters and doctoral levels (Turner, Myers, & Creswell, 1999). A review of the National Center for Education Statistics (Musu-Gillette et al., 2016) reveals a 44% increase in the number of doctoral degrees awarded when comparing the 2002-2003 timeframe to 2012-2013. There has been a 60% increase in doctoral degrees (included Ph.D., EdD, and other comparable degrees) awarded to Black students, an 83.7% increase for Hispanic students, and a 53.3% increase for Asian/Pacific Islander students over this time. It is unclear why increases in terminal degrees awarded have not translated to an increase in academic appointments for REM groups. Due to the early exit of REM students from the academic pipeline, the focus of this study shifted to the REM student at the entrance to the pipeline (see Figure 1.1).

The Ecological Systems Theory

The EST (Bronfenbrenner 1994) is an ecological model of human development that advocates for a holistic model of viewing human development. Bronfenbrenner (1994) highlights that during human development, there are progressively more complex interactions in the environment. The ecological environment is conceptualized as nested structures comprising a microsystem, mesosystem, exosystem, macrosystem, and chronosystem. Using EST, the REM student is conceptualized as located at the center of the nested model, with the microsystem including proximal processes with peers, faculty, and family (see Figure 1.1).

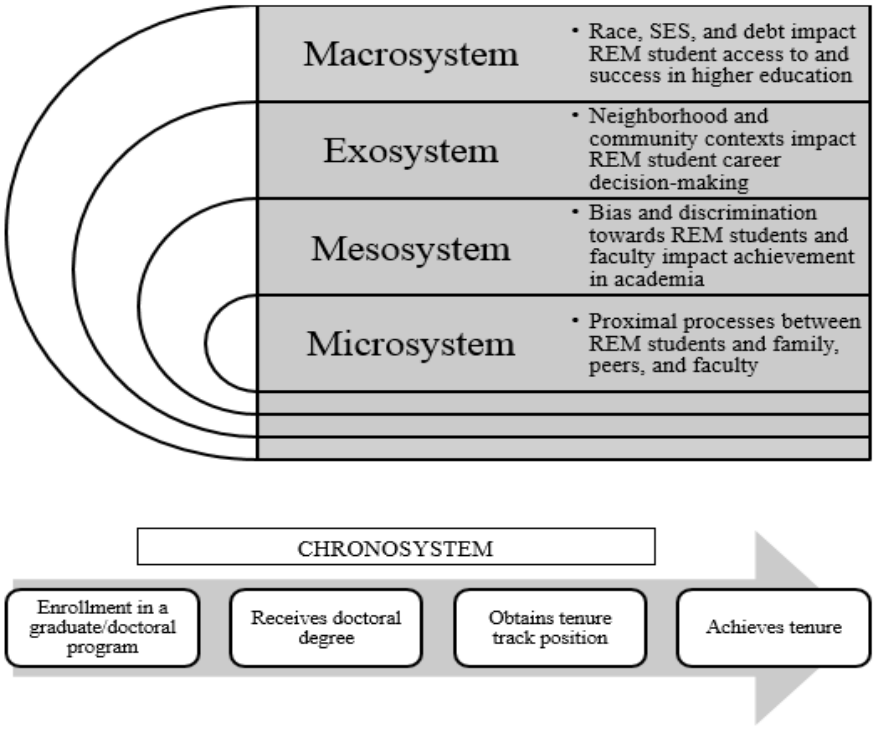

Figure 1.1. The overlap between the academic pipeline theory and the EST as the chronosystem captures the development of REM students over long periods as they progress through the academic pipeline.

Proximal processes may facilitate or hinder REM students' academic success and the pursuit of an academic career. Bronfenbrenner and Morris (2006) emphasize the importance of the bidirectional perspective and degree of reciprocity in any proximal process. The bidirectional perspective is helpful to underscore the impact that REM faculty have on REM students and vice versa. Academia, conceptualized as a collection of microsystems, comprises the mesosystem. The academic environment is fraught with bias and discrimination towards REM students (Ackerman-Barger & Hummel, 2015; Odom et al., 2007) and faculty members (Hassouneh, Lutz, Beckett, Junkins, & Horton, 2014; Turner et al., 1999). Neighborhood and community contexts comprise the exosystem. Community strongly influences REM student career choice (Odom et al., 2007). The macrosystem includes the impact of race, culture, and socioeconomic

status (SES) on REM student access to and success in higher education as well as career decision-making.

The dimension of time is also an important factor to be considered, notably macro time. Bronfenbrenner (2006) emphasizes the importance of development over long periods and the societal implications of this evolution. Here the two theoretical systems overlap as the chronosystem captures the changing U.S population demographic and the failure of the physical therapy profession to match this change, as well as the development of the REM student and movement along the academic pipeline (see Figure 1.1). The chronosystem helped conceptualize the REM student as on a development continuum as they seek to understand themselves and their culture in relation to the dominant culture. Racial and cultural identity development is explored further next.

The Racial/Cultural Identity Development Model

The minority identity development model (Atkinson, Morten, & Sue, 1998) captures the psychotherapy needs of an ethnically and culturally diverse patient population and is helpful in appreciating REM students as having individual and unique experiences in academia. The racial/cultural identity development (R/CID) model (Sue & Sue, 2012), an iteration of the minority identity development model, describing the development of the minority person towards a state of acceptance of their racial/cultural identity. During the first stage, conformity, the REM student faces the pressure of assimilation and acculturation and prefers the values of the dominant culture to their own. In the second stage, dissonance, the REM student begins to acknowledge the positive aspects of their culture and becomes aware that not all aspects of the dominant culture are positive. In the resistance and immersion phase, the REM student feels increased respect for minority values and rejects the dominant culture. In the introspection phase,

the REM student has a beginning awareness of the experiences of other oppressed groups but also gains an appreciation for what might be valuable in the dominant culture. In the final stage of integrative awareness, the REM student appreciates the unique aspects of their own culture and the dominant culture and perceives themselves at a group level of identity but also as a member of society (Sue & Sue, 2012).

In contrast to the Cross model of psychological nigrescence (Cross, 1971), the R/CID is not specific to one racial/ethnic group and may help address multiple populations. In higher education, the R/CID model may be useful when considering the mentoring needs of students of racial/ethnic minority backgrounds and understanding the role that oppression may have played in the REM students' development. The literature synthesis will begin by exploring the impact of time (the chronosystem) on the POP.

Chronosystem: Growing a Diverse Physical Therapy Workforce

Through the lens of macro time (Bronfenbrenner, 2006), the PT profession has seen slow progress towards racial and ethnic diversity. In a position paper promoting holistic admission strategies in DPT education, Wise et al. (2017) highlight that the racial and ethnic diversity in PT programs has declined over the last decade. Framed by the academic pipeline theory (Berryman, 1983), it follows that the growth in the number of REM faculty in DPT programs has seen slower progress towards racial diversification. In the 2018-2019 academic year, 86% of core faculty (n=2,350), and 84% of the associated faculty (n=2,162), teaching in accredited PT programs in the U.S., self-reported as White (CAPTE, 2019). If associated faculty (defined as those with classroom or laboratory teaching responsibilities) is a pipeline to core faculty positions (and this remains to be seen), this does not bode well for any impending increase in the number of racially and ethnically diverse DPT faculty without intervention. Next, the macrosystem is described.

Macrosystem

As REM students must reach critical mass at the entrance to the academic pipeline to feed the supply of REM faculty (Chisholm-Burns et al., 2012), it is vital to understand the barriers to REM students' access to higher education. Two barriers to be considered in the macrosystem include SES and student loan debt. The impact of low SES will be explored first.

The Interaction Between Race, Socioeconomic Status, and Debt

The macrosystem view of the POP highlights the complex interaction between race, SES, and access to education for REM students. In the literature, the analysis of this relationship frequently involves quantitative methodologies (Grinstein-Weiss, Perantie, Taylor, Guo, & Raghavan, 2016; Jackson & Reynolds, 2013) and survey research (Dugger et al., 2013) with large study samples. Theoretical models leveraged include the intergenerational racial stratification theory (Oliver & Shapiro, 1997), which highlights that the disadvantages of past generations have resulted in current racial disparities in financial well-being (Jackson & Reynolds, 2013).

To examine student debt burden among low- and moderate-income households and to determine if there were different borrowing patterns by race, Grinstein-Weiss et al. (2016) analyzed data from 17,684 participants who filed taxes in 2013. Results revealed that 75% of respondents enrolled in college had student loan debt, and, as expected, the amount of debt increased as the level of education increased. Lower-income and assets predicted higher education debt. The odds of having debt was twice as high for Black respondents compared to their White counterparts, and the amount of debt was greater for Black respondents compared to White respondents. Results highlight that even when controlling for SES, the rate of student debt was higher for Black respondents compared to White respondents, and Black students were more

vulnerable to cumulative borrowing effects (Grinstein-Weiss et al., 2016). To investigate student loan debt among Black and White students, Jackson and Reynolds (2013) analyzed student loan use, enrollment persistence, whether students received their Bachelor's degree, whether they ever defaulted on a loan, and parent SES. Ultimately, 57% of Black students took out federal loans, but 70% of these students with federal loans left college without receiving a degree, and 30% reported defaulting on a loan (Jackson & Reynolds, 2013). The relevance to the POP is that while student loans can also increase enrollment persistence and college completion, REM students leave undergraduate programs with high student loan debt (Grinstein-Weiss et al., 2016), which may deter the pursuit of graduate education.

Findings of racial inequities in debt (Grinstein-Weiss et al., 2016; Jackson & Reynolds, 2013) have been mirrored in health sciences programs. To explore the racial and ethnic disparities in medical student debt, Dugger et al. (2013) surveyed 2355 medical students from 111 medical programs in the U.S. Results revealed that 62.1% of respondents reported debt greater than $150,000, and Black and White students had more debt compared to Asian and Hispanic students. Findings strengthened the link between race and ethnicity as predictors of debt. However, the differences in debt load between Black, Asian, and Hispanic students reinforces that REM groups cannot be considered a homogenous when it comes to debt. Disparate debt burdens may explain decreased enrollment of Black students in medical school compared with an increased enrollment of Hispanic students. Additionally, the debt burden may be a factor in the REM students' decision to pursue a more lucrative career path than academia (Julien et al., 2014).

Medical school debt burden upon graduation (Dugger et al., 2013) was not dissimilar to findings of DPT student debt, frequently more than $100,000 (Thompson, Coon, & Handford,

2011). In 2019 the average total cost of a DPT program was $65,170 at a public institution and $112,714 at a private institution, not including expenses related to room and board (CAPTE, 2019). A recent report by the American Physical Therapy Association (PT in Motion, 2020) reveals that most physical therapy graduates are in debt for an average of $153,000, with most of the debt load related to physical therapy education. Survey respondents reported deferring home purchases and taking on additional employment outside of the physical therapy profession. Impacts were more severe on physical therapists of color, those with lower household income, and those with financial dependents (PT in Motion, 2020).

In a retrospective study of graduates from one PT program, total tuition for the 2007 cohort was $52,690 (Thompson et al., 2011). Most participants (86.3%) relied on student loans to finance their education, and those without family support or employment income borrowed more than their tuition and fees. Limitations included a small sample of mostly White students. Asian students, comprising 4% of the study population, were the only REM group represented in this study, offering little insight into how REM students finance their PT education and whether cost deters minorities from entering the field of physical therapy. It is evident that at the macrosystem level, society and culture play essential roles in REM student career decision-making (Haley, Jaeger, & Levin, 2014; Levin, Jaeger, & Haley, 2013; Yeowell, 2013).

The Impact of Culture on Career Choice

Understanding what motivates REM students to enter the health professions and the field of physical therapy has implications for diversifying the profession. Both quantitative (Nuciforo, 2015) and qualitative research (Haley et al., 2014; Odom et al., 2007) inform the impact of culture on REM student career decision-making. REM interviewers frequently conducted focus group interviews with minority students (Odom et al., 2007). Additionally, focus groups, as

opposed to individual interviews, leveraged the shared minority experience, potentially increasing student empowerment to speak up in the presence of peers (Odom et al., 2007; Sanchez, Poll-Hunter, Stern, Garcia, Brewster, 2016). To minimize the effect of small samples, researchers used triangulation, including member checking and peer debriefing, to bolster trustworthiness of findings (Haley et al., 2014)

To explore the obstacles to and facilitators of underrepresented minority (URM) student success in medical school, Odom et al. (2007) conducted focus group interviews with 43 URM students from the first year through the fourth year of medical school. Participants defined success through professional achievement but also by having a positive impact on their families and communities, and viewed financial wealth in terms of surviving, supporting their families, and giving back to the community. Perceived facilitators of success included scholarships, social support, professional exposure, and personal characteristics. Social support (cited as the most critical facilitator of success) stemmed from family, friends, religious groups, and school administration. Participants cited a lack of support, discrimination, lack of cultural representation on campus, testing, financial factors, and personal characteristics as barriers to success (Odom et al., 2007). This study highlighted the need to explore REM students' perceived barriers and facilitators to success while enrolled in a DPT program.

In a survey of 856 PT students, Rozier and Hamilton (1991) found that students were drawn to the profession because of the attractive salary, job availability, prestige, and geographic flexibility. Students expressed motivation for wanting to help others and reported that family and friends were most influential in their decision to pursue a career in PT. The researchers did not report demographic data, including race and ethnicity of respondents, making it impossible to ascertain if motivators differed between race groups (Rozier & Hamilton, 1991).

Nuciforo (2015) conducted a quantitative study to describe the URM applicant pool to DPT programs in the U.S. and to describe the differences between URM and White applicants. Results revealed that African American and Hispanic applicants scored lower on the GRE and had lower GPA scores than White applicants. Between 2010 and 2012, there was a significant increase in the number of applicants to DPT programs, highlighting an increasingly competitive process (Nuciforo, 2015). With lower GRE and GPA scores, REM students are at a disadvantage if applying to programs which base admission solely on academic achievement, highlighting the need for DPT programs to utilize holistic rubrics when scoring applications if they wish to diversify their student body (Wise et al., 2017). Notably, Nuciforo (2015) found that African American and Hispanic applicants were more likely to apply to a DPT program with a REM faculty member and less likely to apply to a program without a REM faculty member. Due to the purely quantitative nature of this study, it is not possible to discern the motivation behind REM student application behavior. Of significance is that programs were coded as having REM faculty if they had one or more REM faculty members (Nuciforo, 2015). The underrepresentation of REM faculty in physical therapy higher education is highlighted as well as the challenges facing REM faculty who wish to mentor REM students but are outnumbered on their campuses.

More recently, the American Council of Academic Physical Therapy (ACAPT) Diversity Task Force (DTF) surveyed 2,513 DPT students to determine why students from underrepresented and disadvantaged backgrounds decide to pursue physical therapy (Moerchen et al., 2018). Two themes emerging from open-ended survey questions: (a) experience and influence and (b) values and fit. All student respondents reported being influenced by personal experience with physical therapy, and this was the primary influence for White respondents. However, values and fit were equally impactful for students from disadvantaged backgrounds

having a more substantial influence on their career decisions. Students who were not White and those from disadvantaged backgrounds reported being influenced by values and interests, the patient-therapist relation, and by inclusion and diversity. The issue of inclusion and diversity was barely mentioned by White students, indicating a difference in career motivations between minority students and their White counterparts who responded to the survey (Moerchen et al., 2018). However, it should be noted that only 2,513 students responded, indicating a roughly 10% survey response rate.

While minority students reported being motivated by the patient-therapist relationship (Moerchen et al., 2018), the close physical contact between therapist and patient may present concern and challenges for students from ethnic groups where there is a conflict with cultural norms, religious beliefs, and tradition (Yeowell, 2013). High achieving REM students also face parental and community pressure to pursue more prestigious fields, such as medicine or law, as opposed to PT (Yeowell, 2013). Once matriculated into a graduate program, REM students face cultural and social barriers to pursuing a career in academia and find a faculty role to be at odds with their life goals (Haley et al., 2014). This is explored next by examining the exosystem.

Exosystem: Neighborhood and Community Contexts

The exosystem includes family, social networks, and neighborhood and community contexts, which indirectly impact the REM student. To explore this influence, qualitative methods framed by social identity theory (Tajfel & Turner, 2001) describe how students of color link their professional identity with that of a faculty member, and how this impacts career decision making (Haley et al., 2014). Interviews with 26 graduate students of color, including African American, Asian American, Native American, and Latino/a students, revealed a close connection between cultural, social identity, and participants' career decisions. Race and ethnicity

were found to factor into the decision-making process. Participants expressed wanting to integrate their identity with their career path and give back to their communities, either by serving as a role model for other graduate students of color or through engaging in research about minorities. Participants were motivated to bring about social change through their work, but some found a faculty role to be at odds with their life goals. Students found demands on time and infringement on home life unappealing and detracting from other priorities such as time spent with family and in the community (Haley et al., 2014). A small sample of students completing graduate degrees in humanities, arts, social sciences, science, and engineering limits the generalizability of this study's findings to students in the health sciences. However, REM student commitment to family and giving back to the community expressed in this study echo findings by Odom et al. (2007). The researchers found that REM medical students choose to give back to their communities by serving as clinicians (Odom et al., 2007). The REM student experience in the mesosystem of academia and parallels to the REM faculty experience follows.

Mesosystem: Racial Bias in the Academe

The mesosystem comprises the interactions between settings, which include the developing person (Bronfenbrenner, 1994). For this research, academia, conceptualized as a collection of microsystems, comprises the mesosystem. Critical race theory (Ladson-Billings & Tate, 1995) is frequently used as a framework to explore the experience of REM students and faculty in the academy (Ackerman-Barger & Hummel, 2015; Daniel, 2007; Haley et al., 2014). Using qualitative methods to collect data and critical race theory as a lens to analyze data allows researchers to legitimize participant experience (Levin et al., 2013) and to uncover the REM perspective through storytelling (Ackerman-Barger & Hummel, 2015).

Seven nurses, who identified their ethnicity as African American, Latina, Wailaki, or East-Indian/Pacific Islander, were interviewed to explore the experiences of nurses of color in their educational programs (Ackerman-Barger & Hummel, 2015). Two broad themes emerged from data analysis. The first theme was one of exclusion. Participants reported experiencing exclusion in the classroom and the clinical setting by faculty and peers. Incidences of bias ranged from subtle to blatant racism, and participants reported seeking support from REM professors outside of their program. Only one participant who attended a historically Black college shared no instances of exclusion. In contrast to the first theme, the second theme was one of inclusion. Participants reported receiving acknowledgment for succeeding under challenging conditions. Findings highlighted that racism has persisted over time in nursing education, although it may have transitioned from blatant to subtle (Ackerman-Barger & Hummel, 2015).

Interviews with 15 African American and Latina/o students enrolled in a graduate social work program at a predominantly White institution revealed eight core themes (Daniel, 2007), five of which dealt with the lack of REM faculty support and mentorship. Participants viewed the presence of REM faculty as being critical to their success, reporting that the lack of African American and Latina/o professors contributed to feelings of cultural and racial isolation. Participants reported difficulty forming productive relationships with White faculty and peers. During fieldwork experiences, participants expressed feeling forced to ignore racial tensions in the community for fear of bringing this up to White supervisors. Another theme included the absence of a culturally relevant curriculum that failed to include minority issues and perspectives. Additionally, participants cited feeling as if race was a dominant force in their interactions with others (Daniel, 2007).

While a small sample limits both studies (Ackerman-Barger & Hummel, 2015; Daniel, 2007), significance includes incidences of exclusion not just on campus but in the community/clinical setting as well. While Daniel (2007) interviewed graduate social work students, parallels can be drawn with PT students who also complete clinical experiences under the supervision and guidance of a mostly White group of associated faculty (CAPTE, 2017). Cognitive apprenticeship in the clinical setting is vital to success in the health sciences, and REM students score significantly lower than their White counterparts on final PT clinical experiences (Naylor, Norris, & Williams, 2014). Feelings of exclusion and isolation may offer insight into student challenges in PT programs and maybe a potential cause of attrition from the academic pipeline.

REM student experience of racism and exclusion on campus mirrors the experience of REM faculty. Zambrana et al. (2017) used a mixed methods approach to explore how URM faculty experience institutional racism at predominantly White institutions. The sample included 543 faculty members who were either African American, Latina/o, or of Puerto Rican descent, holding tenure-track assistant or tenured associate professor positions. Three themes emerged from data analysis. The first was of insidious racism, which ranged from blatant to subtle. Participants described serving on hiring committees that were resistant to hiring more than one URM faculty member per department. Another theme that emerged was the racial/ethnic tax burden. Participants described unfair service burdens related to minority affairs. The final theme that emerged was around stereotyping and devaluation of minority scholarship and credentials (Zambrana et al., 2017). This study provides valuable insight into potential reasons for poor recruitment and retention of REM faculty. Participant description of hiring committees resistant to hiring more than one URM faculty per department highlights that pipeline issues are not solely

responsible for decreased faculty diversity on college campuses. Reports of unfair service burdens on REM faculty are echoed by Turner et al. (1999).

In a phenomenological study to explore the lived experience of nursing faculty, Kolade (2016) interviewed one Hispanic, one Asian, and three African American nursing faculty members. Six themes emerged from data analysis. The first theme was missing mentorship. Participants reported lacking mentorship early in their careers and expressed a need for minority mentors and role models. The second theme was a lack of collegial support. Participants shared that they lacked common ground with White colleagues who had no interest in their scholarly projects. The third theme that emerged was one of harnessing external support. Participants reported relying on minority faculty outside of their institutions for advice and mentorship. A fourth theme involved participants feeling more of a minority at their institutions, which emerged during interactions with colleagues as well as with students. The fifth theme was acculturation. Participants expressed feeling pressure to fit in to succeed. The final theme was one of isolation (Kolade, 2016).

Reports of stereotyping, institutional racism, and marginalization are evident throughout the literature on the REM faculty experience (Kolade, 2016; Turner et al., 1999; Zambrana et al., 2017), highlighting that there is still much work to be done to promote equity in higher education. In semi-structured interviews with 28 Black professors from two research universities, participants reported incidences of personal racism where they were seen by colleagues as Black first and professionals second (Griffin, Pifer, Humphrey, & Hazelwood, 2011). Responses to racism included some incidences of physical departure from the institution, but, more commonly, participants responded to challenges by building external support networks, managing stereotypes through excelling at their jobs, and engaging in institutional service to give voice to

other minorities. The inclusion of rich descriptive data on study settings and the participants increases the potential for reproducibility of this study. However, study sampling increases the potential for bias as participants most subjected to racism may have been motivated to participate in the study.

In contrast to reports of stereotyping and bias from REM faculty, institutional leaders report a positive campus climate for minority faculty (Kaplan et al., 2018). Twenty-four White, 12 Black, four Hispanic, and four Asian institutional leaders who served as Deans, Chairs, Provosts, or on senior leadership committees at their academic medical institutions described the climate for minority faculty at their institutions as neutral to positive. Participants made few comments around discrimination against or marginalization of minority faculty. Kaplan et al. (2018) attribute findings of a positive climate to an evolution away from the racialized settings of the past. However, it is unclear if the study findings support this conclusion. Limitations include a small sample which included majority White representation and the lack of clear theoretical or conceptual framework. A theoretical framework, such as a critical race theory (Crenshaw, 1995), may have resulted in a different interpretation of the study findings. Ultimately, an evaluation of the REM student and faculty experience within the mesosystem reveals an institutional culture of racism that has been slow to change (Kolade, 2016; Turner et al., 1999; Zambrana et al., 2017). The final system in the EST (Bronfenbrenner, 1994), the microsystem, is explored next.

Microsystem

The microsystem in the EST (Bronfenbrenner, 1994) examines the proximal processes which facilitate or hinder REM students' interest in and pursuit of a career in academia. Proximal processes include student interactions with family, peers, and faculty within the academy. The influence of family is explored first.

Proximal Processes: Family

Status attainment theory (Blau & Duncan, 1967) and human capital theory (Becker, 1981) inform the reproduction of advantage perspective, and describe how parents use their financial and educational resources to protect children from education debt (Houle, 2013). Data from the National Longitudinal Study of Youth 1997 and the Postsecondary Education Data System Delta Cost Project database on 4789 young adults revealed a non-linear association between parent income and student loan debt (Houle, 2013). Specifically, young adults from the two highest income brackets were significantly less in debt than those from the lowest income bracket. Young adults with at least one parent who attended college had 54% less debt than those whose parents did not attend college, highlighting the reproduction of advantage perspective. Results revealed African American students to be 57% more in debt than White students. Ultimately, SES was strongly predictive of young adult debt, particularly very high debt (Houle, 2013). Increased student loan debt for REM students from low SES backgrounds may explain low REM enrollment into graduate school and costly PT programs, negatively impacting the supply side of the academic pipeline.

While Houle (2013) examined the impact of the more traditional type of family wealth on REM student trajectory and success, Zell (2014) explored Latina/o students' conversion of sociocultural assets (community cultural wealth) into the types of capital needed to be successful in healthcare graduate programs. The sample included 12 Latina/o graduate students, including two PT students, ranging in age from 22 to 43 years old. Ten participants were first-generation college students. There was evidence of cultural wealth among all participants who converted aspirational capital and linguistic capital into occupational attainment. Zell (2014) concluded that non-traditional and non-material forms of capital are vital to REM student success in graduate

school, and these can be converted into the types of capital which promote positive educational and occupational outcomes. The generalizability of findings is limited by the small sample size. However, students' non-linear trajectory towards college was notable. Students had competing interests during graduate school, including familial obligations and work responsibilities. Competing priorities may offer insight into REM students' challenges in academically rigorous programs such as PT. However, family played a strong role in student success – providing both social and moral support (Zell, 2014). Findings highlight that while low SES families may not be able to protect REM students from debt (Houle, 2013), families can provide other forms of support. Students then convert social support into forms of capital needed to be academically successful (Zell, 2014).

Zell (2014) also found that REM students in health professions programs report using their bilingual status to make connections with other REM students. However, some REM students in health professions programs describe being isolated and excluded (Ackerman-Barger, & Hummel, 2015). The next proximal process explored includes REM student interaction with peers.

Proximal Processes with Peers and Enforced Social Isolation

Socialization into campus life and productive working relationships with faculty and peers is vital to student success in graduate and doctoral programs (Ramirez, 2017). Interviews with 678 Black students who graduated from a predominantly White university between 1962 and 2003 uncovered five factors which captured the social experiences of Black graduate students. Factors included: (a) White professor discrimination, (b) enforced social isolation, (c) underestimation of academic ability, (d) White student discrimination, and (e) the enforced representation of race (Johnson-Bailey, Valentine, Cervero, & Bowles, 2009). Black students

reported frequent social neglect by White students, blatant and subtle racism, and being subjected to racial assumptions about their academic abilities by White faculty and students. Limitations include a sample of minority alumni who were ultimately successful in degree attainment. This limits transferability to REM students who face similar challenges and do not persist in the educational system. The study setting of one university also limits the transferability of findings but echoes REM groups' reports of exclusion and isolation in institutions of higher education throughout the U.S. (Smith, Cech, Metz, Huntoon, & Moyer, 2014).

Native American first-year college students express challenges with transitioning from the tribal community to the academic setting and report feeling both hyper-visible and ignored by non-Native classmates (Smith et al., 2014). The study setting in two universities with high numbers of Native American students and strong support systems in place may limit the transferability of study findings. Students at universities with a lower number of Native American students and fewer or no institutional support systems may demonstrate even stronger feelings of exclusion. The sentiment of hypervisibility and invisibility expressed by students is shared by African American faculty who report feeling hyper visible because of appearance and advocacy efforts but also invisible, not fitting in within the dominant culture on campus (Turner et al., 1999).

While Johnson-Bailey et al. (2009) and Smith et al. (2014) examined programs outside of the health professions, Steed (2014) examined the level of cultural sensitivity in students and faculty at one Southern allied health professions program. Participants included 244 White students and 23 White faculty who completed self-report measures designed to measure White persons' sensitivity and bias towards African Americans. Results revealed a statistically significant difference between programs, with PT and physician assistant students scoring higher

and more negatively towards African Americans than occupational therapy students. Faculty scored lower than students indicating less bias. However, overall, students and faculty scored higher than population norms indicating more racial bias towards African Americans than the general population (Steed, 2014). These findings highlight the need for a racially diverse healthcare workforce to provide culturally competent and humanistic care for all members of the population (Ackerman-Barger & Hummel, 2015) and the need for implicit bias training for all healthcare professional students and faculty.

When examining incidences of discrimination towards minority students over time, White professor discrimination has decreased over time, but reports of White student discrimination have increased over time. However, minority students report underestimation of their academic ability and enforced representation of their race as the most severe problems during their time in the academy (Johnson-Bailey et al., 2009). The effects of being subjected to stereotyping and the impact of stereotype threat on the cognitive functioning of REM students is explored next.

Stereotype Threat Negatively Impacts Minority Student Success

It has been highlighted that REM status is predictive of academic difficulty in PT programs (Utzman et al., 2007a) and failure on the national PT examination (Utzman et al., 2007b). Even when age, gender, and SES are controlled for, REM students have a lower chance of degree attainment than White students enrolled in PT programs (Williams et al., 2015). The purely quantitative nature of these studies (Naylor et al., 2014; Utzman et al., 2007a; Utzman et al., 2007b; Williams et al., 2015), limits the ability to ascertain the cause of REM student challenges in PT programs and to determine how their needs may differ from their majority colleagues. Stereotype threat susceptibility and the associated extraneous cognitive load may

negatively impact cognitive processing and lead to attrition or poor performance of REM students in DPT programs. A cognitive perspective provides a focus for understanding potential reasons for racial and ethnic REM student challenges in higher education.

The cognitive perspective. In contrast to the behaviorist perspective, which focuses on stimulus and response, the cognitive perspective focuses on the learner's internal processes (Ertmer & Newby, 1993/2013). In the cognitive view, the learner is a processor of information who receives input, stores the knowledge along with its uses, and retrieves knowledge as needed. The major components of the information processing theory are attention, perception, short-term memory (STM), and long-term memory (LTM; Schunk, 2012). The STM has a finite holding capacity, limiting how much information the learner can receive, process, and remember (Miller, 1956). In contrast, the LTM has unlimited capacity for storing knowledge in schema (Schunk, 2012). PT students must store knowledge and be able to retrieve information from the LTM efficiently to solve complex, often ambiguous, patient problems (Wainwright, Shepard, Harman, & Stephens, 2011). Cognitive load theory (Sweller, 1988; van Merrienboer & Sweller, 2005) proposes that there is a limit to the capacity of the working memory. As cognitive processing capacity is limited, with excessive cognitive load, there is little room for schema acquisition (Sweller, 1988). Stereotype threat may serve as extraneous load, hampering performance.

When members of a group about whom negative societal stereotypes exist fear conforming to that stereotype, intellectual functioning may be impacted. Stereotype threat negatively affects the intellectual test performance of high achieving REM students, particularly when the stakes are high, and attention is drawn to students' racial background (Steele & Aronson, 1995). This may result in REM students distancing themselves from the educational experience, thereby decreasing motivation and educational success (Steele & Aronson, 1995).

In a study of 111 health professions students, Ackerman-Barger, Valderama-Wallace, Latimore, and Drake (2016) found that minority students are at higher risk for experiencing stereotype threat than White students. Minority was operationally defined as students who self-identified as African-American, Hispanic, or Native American. Minority students reported feeling intellectually inferior and as if they did not belong in the health professions. The authors concluded that, due to the fear of conforming to negative stereotypes, minority students in health professions programs are at risk of not reaching their full academic potential.

Faculty are critical to the success of REM students in the health professions (Ackerman-Barger & Hummel, 2015), and faculty need guidance on how to best support REM students (Ackerman-Barger et al., 2015). However, a barrier that REM students encounter at the microsystem level includes the lack of REM faculty to serve as role models (Julien et al., 2014; Daniel, 2007; Ramirez, 2017). The need for racially congruent faculty and mentors is explored next through the lens of the constructivist perspective.

Cognitive apprenticeship in physical therapy education. The constructivist perspective (Ertmer & Newby, 1993/2013) provides insight into specific mentoring needs within PT and helps illuminate how REM student mentoring needs may differ from their majority peers. The constructivist perspective equates learning with creating meaning from experience (Ertmer & Newby, 1993/2013) and emphasizes that, for learning to be meaningful and lasting, there must be the opportunity for practice in a contextualized setting (Ertmer & Newby, 1993/2013; von Glasersfeld, 2005). Also, for learning to be enduring, the learner must be presented with tasks and tools that are relevant to the setting (Ertmer & Newby, 1993/2013), and there should be interplay between activity, concept, and culture (Brown, Collins, & Duguid, 1989). Within this situated learning model, cognitive apprenticeship is essential (Brown et al., 1989).

Traditional apprenticeship describes the apprentice working under the expert where the focus is on the learner completing an easily observable skill that meets the needs of the workplace (Lyons, McLaughlin, Khanova, & Roth, 2017; Woolley & Jarvis, 2007). Cognitive apprenticeship, however, involves the learner completing tasks in the authentic environment with the focus shifted to tasks that meet the needs of the learner (Lyons et al., 2017). Also, there is an emphasis on the expert reasoning, which precedes and occurs during task completion (Woolley & Jarvis, 2007). The purpose of cognitive apprenticeship is to bridge the gap between knowledge taught in the classroom and application of knowledge in the real world (Brown et al., 1989; Lyons et al., 2017). Cognitive apprenticeship is, therefore, vital to facilitate PT students transferring classroom concepts to a dynamic and complex clinical environment.

The concept of guided practice in the healthcare environment under the role of a mentor is one of the hallmarks of PT education (Plack, 2008). Classroom knowledge does not begin to make sense to the PT student until they apply their knowledge and skills in the clinical environment, and the student engages with the community of practice (Plack, 2008). The role of the mentor is essential to highlighting the cognitive and metacognitive processes that are required for the learner to progress from novice to expert (Lyons et al., 2017). The functions of the mentor in situated learning is also vital to more fully understanding the problem of the practice. The unique mentoring needs of minority students are explored next.

Minority Student Mentorship Needs

Student apprenticeship and engagement in the clinical environment cannot occur without the expert to provide mentorship (Plack, 2008), and REM students in the health sciences report that faculty are critical to their success (Zell, 2014). However, REM students also report a lack of REM role models in their programs (Ackerman-Barger & Hummel, 2015; Daniel, 2007;

Ramirez, 2017) making college campuses unwelcoming (Levin et al., 2013), and leading to feelings of cultural and racial isolation (Daniel, 2007). REM students are therefore limited in their ability to reach their full academic potential (Ramirez, 2017). African American and Hispanic medical residents report actively seeking out mentors of the same race/ethnicity but having difficulty securing racially concordant mentor relationships (Yehia et al., 2014). Griffin, Pérez, Holmes, and Mayo (2010) posit that, as many faculty of color graduated from predominantly White institutions and experienced racial stereotyping and isolation, there is a greater sense of connection between students of color and their REM mentors. Medical residents report that racially concordant mentors allowed them to see themselves in their mentor, whereas incompatibility requires having to explain the context and nuances of their situations (Yehia et al., 2014).

Due to a lack of REM faculty role models, REM students report seeking support from REM faculty outside of their programs (Ackerman-Barger & Hummel, 2015; Ramirez, 2017). The needs expressed by REM students for racially concordant mentoring relationships (Julien et al., 2014; Daniel, 2007; Ramirez, 2017) are echoed by REM faculty (Hassouneh et al., 2014; McCallum, 2017; Salvucci & Lawless, 2016). While faculty of color frequently served as mentors to others, faculty report lacking mentorship and having to seek out mentors and supportive peers outside of their institutions (Hassouneh et al., 2014).

Mentorship could positively impact the success of REM students in DPT programs and assist students with reaching their full academic potential (Ramirez, 2017). All faculty, regardless of race, value a supportive environment (Spann, 1990), and finding this lacking in academia, REM faculty strongly advocate for the formation of a support structure of other minorities within and across academic institutions (Turner et al., 1999). Faculty of color in the STEM fields share

the opinion that mentoring and advising is vital to long-term success in STEM fields (Griffin, Pérez, Holmes, & Mayo, 2010). In a mixed methods study examining the factors which facilitated Black professors' success in STEM fields, professors reflected on their mentoring experiences with undergraduate professors, graduate advisors, and older colleagues who were either the same-race or White. Participants expressed that, regardless of race, mentors who believed in their potential to be successful were vital to their development. Participants described experiences beyond traditional advising for academic coursework that included being encouraged to network and explore research opportunities. These opportunities eventually helped students identify areas of future scholarship, find jobs and, ultimately, achieve tenure (Griffin et al., 2010). Mentorship could also directly impact the recruitment and retention of REM faculty in PT, as mentorship has been found to increase the pursuit of academic careers (Yehia et al., 2014).

Griffin et al. (2010) highlight the importance of exploring effective mentoring practices for REM students beyond time spent with faculty. The authors advocate for detailed research questions about social support, career advice, and role modeling so that connections can be made between mentoring, REM student academic achievement, and degree attainment. Additionally, qualitative methodology is encouraged to explore how mentorship can have a lasting influence on REM students (Griffin et al., 2010). For these reasons, the focus of this study is on the exploration of the perceived barriers and facilitators of success and the perceived mentoring needs of REM DPT students.

Conclusion

A review of the literature highlights a complex problem with two mutually dependent variables. REM students need to reach critical mass to feed the supply of REM faculty and see

REM faculty as vital to their success in health sciences programs (Sanchez et al., 2016; Yehia et al., 2014). At each system within the EST, race, and ethnicity play a factor in REM student success and movement along the academic pipeline. A review of the literature highlights the value of the qualitative approach in understanding the unique perspective of REM students and faculty. Using critical race theory (Crenshaw, 1995) as a lens to analyze qualitative data allows for the legitimization of participant experience and uncovering the REM perspective through storytelling.

At each stage of the academic pipeline, REM students and faculty express the need for REM mentors who can appreciate their unique experience within racialized academic institutions and provide support (Yehia et al., 2014). Minority mentoring needs have been explored in psychology (Chan, 2008; Chan, Yeh, & Krumboltz, 2015), nursing (Salvucci & Lawless, 2016), and academic medicine (Hassouneh et al., 2014). However, the mentoring needs of REM DPT students and faculty has yet to be explored. This highlights the gap in the literature that this study sought to contribute to through a needs assessment. With many complex constructs that warrant further investigation, it is helpful to remember Pedersen (2000), who argues 'Complexity is our friend and not our enemy because it protects us from accepting easy answers to hard questions' (Pedersen, 2000, p. 32).

Chapter 2: Empirical Examination of Factors and Underlying Causes

Specific to the field of physical therapy is the role that mentorship plays in the educational experience. Situated learning and guided practice under the supervision of a mentor in the healthcare environment is one of the hallmarks of physical therapy education (Plack, 2008); however, it is unclear whether mentoring in physical therapy education meets the needs of the REM student. REM students in the health sciences express the need for racially concordant mentors who can appreciate their unique experience within racialized academic institutions (Daniel, 2007; Sanchez et al., 2016). While minority mentoring needs have been explored in nursing (Salvucci & Lawless, 2016) and academic medicine (Hassouneh et al., 2014), the mentoring needs of REM DPT faculty and students had yet to be explored. This needs assessment sought to fill that gap in the literature.

Research Questions

The needs assessment explored barriers and facilitators of REM student academic success and the role of mentorship in the lives of REM students enrolled in a DPT program. This research aimed to investigate the following questions:

RQ1: What factors facilitate racial and ethnic minority student academic success in a DPT program?

RQ2: What factors serve as barriers to racial and ethnic minority DPT students' academic success?

RQ3: What are physical therapist students' attitudes and beliefs about the role of mentoring in physical therapy education?

RQ4: What role does racial concordance play in mentoring relationships between physical therapist students and faculty?

Context of the Study

The site for this empirical study was a graduate school with entry-level and post-professional programs in nursing, occupational therapy, physical therapy, physician assistant studies, speech-language pathology, and genetic counseling. In 2018, the DPT program included three cohorts of students making up a total of 208 graduate students, supported by 17 core faculty members.

Method

Research Design

This study used a mixed methods explanatory sequential design (Creswell & Plano Clark, 2011), including quantitative methods to analyze pre-existing performance data from four cohorts of DPT students who graduated from one program between 2014–2018. This analysis informed the qualitative methodology. A review of the literature highlighted the value of qualitative research methods in understanding the unique perspective of REM students (Ackerman-Barger & Hummel, 2015; Beard & Julion 2016; Daniel, 2007). Focus group interviews with REM DPT students and graduates explored perceptions of facilitators and barriers to success while enrolled in a predominantly White institution. Focus groups, as opposed to individual interviews, leveraged the shared minority experience, potentially increasing student empowerment to speak up in the presence of peers (Odom et al., 2007; Sanchez et al., 2016). Minority students' definition of success was also explored.

Four sets of data from one DPT program informed this empirical analysis.

- Pre-existing demographic and academic data (including grade point average and course failure) from four cohorts of physical therapy students who graduated between 2014-2018;

- Pre-existing qualitative data from a campus climate survey administered in 2017 and graduate exit surveys administered in 2013, 2015 and 2016;
- Primary data collected via an online survey explored physical therapist students' perceptions of mentoring; and
- Primary data collected via focus group interviews explored racial and ethnic minority students' perceptions of barriers and facilitators to academic success.

Participants

Secondary data sample. The sample of four physical therapist student cohorts who graduated between 2014 and 2018 included 234 female students (69.6%) and 101 male students. The increased representation of female students is consistent with the demographic profile of the physical therapy profession which in 2016 was 69% female (APTA Workforce Data, 2016) Students self-reported as White (57.3%), Asian (14%), Hispanic (7.8%), African American/Black (4.8%), or Alaskan Native/Native American (1.2%) upon application to the program (see Table 2.1). Forty-nine students declined to specify race on application materials. When compared with aggregated data on physical therapist programs in the U.S, the study sample was more racially and ethnically diverse, impacting the generalizability of results.

The second set of pre-existing data subjected to analysis included data from one campus climate survey conducted in 2017 and three exit surveys administered in 2016, 2015, and 2013 respectively. The graduate survey from 2014 was not available for review. Fifteen students completed the campus climate survey. Demographic data on respondents was not collected. A total of 100 students completed the three exit surveys. Demographic data collected in 2013 and 2015 revealed that a total of 48 White students and 12 REM completed the exit surveys.

Table 2.1

Demographic Data of 2014-2018 Cohorts Compared with National Population

Demographic data	Program under study 2014-2018 cohorts	Accredited programs nationwide between 2017-2018
Total number of students	335	32,840
Gender		
Female	234 (69.9%)	20,393 (62.9%)
Male	101 (30.1%)	12,437 (37.9%)
Ethnicity		
Black	16 (4.8%)	3.26%
Asian	47 (14%)	8.21%
Hispanic	26 (7.8%)	6.29%
Native American/Alaskan Native	4 (1.2%)	0.43%
White	192 (57.3%)	75.9%
Mixed race	1 (0.3%)	--
Unknown	49 (14.6%)	3.07%

Note: The data reflects accredited and developing physical therapist education programs in the United States for the academic year 2017-2018 (CAPTE, 2018). CAPTE bears no responsibility for interpretations presented, or conclusions reached based on the analysis of this data.
Option added as of 2017 Annual Accreditation Report for Student Gender 'Other/Choose Not To Answer' explaining the missing gender data.

Primary data sample. In the 2017-2018 academic year, there were 225 graduate students enrolled in the DPT program under study. Of this sample, 30.7% self-reported belonging to a racial/ethnic minority group (African American/Black, Asian, Hispanic, American Indian/Alaskan Native, or mixed-race, including one of these minority groups). Focus group participants were recruited from students who self-identified as belonging to a racial/ethnic minority group on application materials, as well as from 23 REM physical therapists who graduated from the institution in 2018. Students and graduates who did not specify race or ethnicity on their admissions application were excluded from recruitment. REM students and graduates were asked to participate in focus group interviews about perceived barriers and facilitators to success (see Appendix A for the focus group recruitment letter). Due to the small

sample of REM students, the researcher employed purposeful sampling and accepted all participants who met inclusion criteria and consented to participate in focus group interviews. All 225 graduate students received recruitment information to complete an online survey about mentoring perception and needs (see Appendix B).

Recruitment and Consent

The Johns Hopkins University (JHU) Institutional Review Board (IRB) approved analysis of pre-existing data from adults affiliated with the institution under study. Primary data collection was approved under the JHU IRB and Partners Human Research Committee IRB. The consent form used in this study is provided (see Appendix C). To eliminate the effect of coercion between the researcher, a faculty member at the institution under study, and students, program staff distributed all recruitment materials via email. The researcher informed students that all data would be de-identified and only aggregate data reported.

Measures and Instrumentation

Instrumentation

When available, existing data sources triangulated findings from primary data collection sources. Table 2.2 connects the research questions in this needs assessment and the respective constructs and measures.

Measures

Student academic performance. Student academic performance included analyses of cumulative GPA, written and practical examination performance, difficulty during a clinical education experience, and receipt of written warnings. Written warnings are formal notices from faculty that a student is not meeting the program's professionalism expectations. Academic difficulty in a DPT program has been defined as being placed on probation, suspension,

dismissal from a program, or repeating courses due to poor academic performance (Utzman et al., 2007a). In this study, academic difficulty was further defined as course failure (either didactic or clinical) or scoring below 80% on a practical or written examination. Scoring below 80% identified students who may be at risk of failing (scoring below 73%) future examinations and has been used to identify DPT students who may be at risk of failing future examinations (Greene & Karavatas, 2018).

Table 2.2

Instrumentation to Address Research Questions

Research question	Constructs	Existing data sources	Instrumentation for primary data collection
What factors facilitate REM student academic success in a DPT program?	Minority Academic success	DPT academic performance data Campus climate survey Graduate exit surveys	Focus group interview questions adapted from Odom et al. (2007)
What challenges serve as barriers to REM students' academic success?	Minority Challenges	DPT academic performance data Campus climate survey Graduate exit surveys	Focus group interview questions adapted from Odom et al. (2007)
What are physical therapy students' attitudes and beliefs about the role of mentoring in DPT education?	Mentorship Mentoring needs Mentoring resources	None	Online survey adapted from Chan et al. (2015)
What role does racial concordance play in mentoring relationships between physical therapy students and faculty?	Racial concordance Mentoring dyad	None	Online survey adapted from Chan et al. (2015)

Campus climate and exit surveys. Campus climate has been operationalized as an internal institutional factor and includes the levels of respect and support created by the

institution (Turner et al.,1999). At the institution under study, campus climate surveys are routinely (although not annually) conducted to gauge student attitudes and concerns. Results are reviewed by the individual program and the institution's Diversity, Equity, and Inclusion Council to determine whether the school is meeting institutional goals. Graduate exit surveys are conducted annually for program evaluation. Both the campus climate and graduate exit surveys were submitted online and anonymously. Respondent demographic data is not routinely collected.

Student perception of mentorship and mentoring needs. Mentoring is operationally defined as encompassing the dyadic relationship between mentor and protégé, which includes career and psychological functions (Kram, 1985). The purpose of the mentoring relationship is to facilitate professional growth and development of the protégé and racial concordance indicates that there is a shared race or ethnicity between the student-faculty mentoring dyad (Chan et al., 2015). A survey developed for primary data collection (see Appendix D) included questions on mentoring adapted from the Chan et al. (2015) interview protocol, which was based on literature review and conversations with mentors in the field. Table 2.3 maps survey indicators to the constructs under investigation.

The use of items from an existing survey increased the content validity of the survey used in this needs assessment. An initial round of pilot testing and a cognitive interview identified issues with survey items due to the ambiguity of question-wording. The four-stage response model of the thought process outlined by Desimone and Le Floch (2004), used to analyze survey feedback, revealed issues related to comprehension and retrieval. Questions were modified, and the survey, including revised questions, is provided (see Appendix D).

Table 2.3

Operationalization of Constructs to Assess DPT Student Mentoring Needs

Construct	Definition	Indicator	Citation
Mentorship	The relationship between a student and faculty member where the purpose is to facilitate professional growth	How would you define a mentor? What are some activities and practices you associate with mentoring? In your opinion, what are some differences between an advisor and a mentor? Who are your mentors, past or present?	Chan, Yee & Krumboltz, 2015
Mentoring needs	The type of attention, information feedback, and support needed by a student from the faculty member	What are qualities of your mentor or actions he or she takes that makes the relationship a success? How has he/she contributed to your academic/professional development?	
Mentoring resources	Attention, information, feedback support provided by the faculty member	How often do you communicate with your mentor? In what ways do you communicate? What specifically does your mentor do to encourage or support you? How does your mentor act as a role model for you?	
Racially concordant mentoring relationship	Shared race or ethnicity between the mentoring dyad	In what ways are you different from your mentor? Do the differences between you and your mentor affect your relationship How do these differences affect your relationship? How were these differences addressed in your relationship?	

Note: Indicators adapted from Chan, A.W., Yeh, C.J., & Krumboltz, J.D. (2015)

Overall, there appeared to be minimal issues with judgment and mapping answers to a response item (Desimone & Le Floch, 2004) due to the open-ended nature of the questions. However, the open-ended questions did result in the survey taking longer to complete than anticipated. Subjects reported that the survey took between 23 and 50 minutes to complete

online. Survey data were collected and managed using the REDCap electronic data capture tools hosted at the institution. REDCap (Research Electronic Data Capture) is a secure, web-based software platform designed to support data capture for research studies (Harris et al., 2019). During primary data collection, demographic data, including race and ethnicity, was intentionally collected at the end of the survey to avoid stereotype threat from impacting participant responses (Ackerman-Barger et al., 2016; Steele & Aronson, 1995).

Focus group interview questions. Desimone and Le Floch (2004) emphasize that questionnaires often ask questions that require a shared understanding of complex phenomena. To minimize confusion, Porter (2011) encourages detailed explanations in question stems. In this study, facilitators were operationally defined as factors that have contributed to REM student professional success, and barriers were described as those challenges which have inhibited professional success (Odom et al., 2007). However, operational definitions of the construct success (and lack thereof) were omitted from focus group instructions to avoid biasing respondents to researcher definitions of the constructs under examination. Instead, REM student perception of success was extracted during qualitative data analysis. Table 2.4 maps the semi-structured interview questions to the constructs under investigation.

Focus groups, as opposed to individual interviews, allowed the needs assessment to harness the shared minority experience and to increase student empowerment to speak up in the presence of peers (Odom et al., 2007; Sanchez et al., 2016). During interviews, the researcher reiterated deidentification of data to attempt to elicit candid and authentic responses to interview questions. Participants received interview questions prior to interviews to allow for reflection and personal note taking. The interview protocol, adapted from Odom et al. (2007), is provided (see Appendix E).

Table 2.4

Operationalization of Constructs to Assess Minority Student Facilitators and Barriers

Construct	Definition	Indicator	Citation
Facilitators	Factors which have contributed to REM student professional success	As you reflect on your experience in this physical therapy program, name the one aspect/element that you would say has most facilitated your academic success. Based on the definitions of success, what types of support systems and opportunities have facilitated your success or make achieving success easier? What has enabled you to be successful in the past (i.e., as a student) and to overcome any obstacles in your path? What things are available to you now—or should be available to you now—to help you achieve success in the future?	Odom et al. (2007)
Barriers	Challenges which have inhibited professional success	Can you name the one thing that has most inhibited your success? What types of things have or might in future inhibit your success or make achieving success more difficult? What kinds of challenges have you faced getting to this point in the physical therapy program? Are there any personal attributes that have made it challenging for you?	

Note: Indicators adapted from Odom et al. (2007)

Findings and Discussion

Analysis of Performance Data

The researcher conducted a descriptive analysis of pre-existing DPT performance data using the IBM Statistical Package for Social Science (SPSS). Table 2.5 includes the descriptive statistics of the DPT performance data.

Table 2.5

Descriptive Statistics from DPT Performance Data from 2014-2018

Demographics	Total number of students	Unknown race/ethnicity	Minority Student	White Student	p-value
Total	335	49	94	192	
Age on application (N=330)					
Minimum	20	21	20	20	
Maximum	43	35	42	43	
Mean	23	24	23	23	
Degree attainment					
Yes	322	46 (93.9%)	87 (92.6%)	189 (98.4%)	
No – Withdrew	6	1 (0.5%)	4 (4.3%)	1 (0.5%)	
No – Dismissed	7	2 (1.0%)	3 (3.2%)	2 (1.0%)	
Academic difficulty					
Yes	33	6 (12.2%)	15 (16%)	12 (6.3%)	p=0.029*
Longer time to degree attainment					
Yes	23	5 (10.9%)	9 (10.3%)	9 (4.8%)	p=0.033*
No	299	41 (89.1%)	78 (83%)	180 (93.8%)	

Note: Students who did not list race/ethnicity in their application materials were excluded from tests of independence.
* indicates that the value is statistically significant at $p<0.05$

Key findings revealed:

- Over a four-year period, 96% of students (n=322) were successful in degree attainment;
- There were minimal differences in the percentage of REM students compared with White students who were successful at degree attainment;
- Four percent of REM students withdrew from the program compared with less than one percent of White students;
- Sixteen percent of REM students had at least one marker of academic difficulty while enrolled in the DPT program compared with six percent of White students. The Chi-

square test for independence revealed that academic difficulty is significantly correlated with race (p=0.029);

- Ten percent of REM students took longer than three years for degree attainment compared with four percent of White students. This finding was also statistically significant (p=0.033). A longer time to degree attainment was operationalized as taking an additional 12 months or more to attain the DPT degree compared to the rest of the cohort.

Academic difficulty was further analyzed to examine for emergence of patterns. As REM students may speak English as a second language, it was hypothesized that they could potentially experience more difficulty with written examinations compared to practical examinations or clinical education experiences. Written examinations are timed, and frequently include either multiple choice or multi-select questions and tests that are written in English test curricular content as well as language proficiency (Dillon & Tomaka, 2010). However, REM students were more likely to experience academic difficulty on any of the four markers which included both written and practical examination as well as clinical education experiences (see Table 2.6).

Table 2.6

Markers of Academic Difficulty

Marker of Academic Difficulty	REM Students	White Students
Exam grade < 80%	10 (10.6%)	9 (4.7%)
Exam grade < 73%	5 (5.3%)	7 (3.6%)
Practical failure	10 (10.6%)	8 (4.2%)
Difficulty on a clinical education course	10 (10.6%)	8 (4.2%)

Note: Difficulty on a clinical education experience was determined by surveying clinical education faculty to identify students who needed additional academic support while on a clinical experience. Students of unknown race or ethnicity were excluded from the analysis.

Analysis of Campus Climate and Exit Surveys

Qualitative data from a campus climate survey and three graduate exit surveys were subjected to emergent intuitive analysis (Miles, Huberman & Saldana, 2014). Four key themes emerged from the analysis:

- Respect for faculty who were perceived as supportive of student success;
- Students were aware of academic advising services but used this option infrequently;
- Students expressed an appreciation for the diverse campus climate but felt that the institution was not as diverse as it claimed to be; and
- Peers were less supportive and understanding of diverse perspectives than faculty.

Focus Group Interview Findings

Nine female students and six male students participated in focus group interviews with the researcher. Most students who participated (n=10) were in the first year of the program. Additionally, one second-year student, one third-year student, and three 2018 graduates participated. The three graduates represented 13% of the REM sample in the graduating class of 2018. Participants self-reported as African American/Black (n=6), Asian (n=5), or Hispanic (n=4). Interviews were audio-recorded and transcribed. The researcher checked the transcription for accuracy and completed the six-step process for thematic analysis identified by Braun and Clarke (2006). Iterative coding, while data collection was ongoing, allowed the researcher to identify emerging themes and seek to fill in gaps in the data collection process (Miles et al., 2014). The researcher completed first cycle coding using descriptive coding. After second cycle coding, codes were collapsed into pattern codes and this formed the basis of the data driven themes (see Appendix F).

The following themes emerged as descriptors of success: (a) balance, (b) stability, and (c) service. Authentic relationships with faculty and minority peers and application of content during integrated clinical education experiences and small group discussions were perceived as facilitators to success. Barriers to success included language, discrimination, and a lack of representation.

Macrosystem. Themes at the macrosystem level included balance and stability. Codes under balance included family, work, and self-care and spirituality. Participants valued achieving not just professional goals but personal goals as well. This was captured by student two during the pilot focus group: "academic wise I did really well and I'm very happy about that, but the life-balance that I earned is much greater because I think I can be the best version of myself through my profession." Here a participant shares the challenges of competing priorities, that accompanies the non-linear trajectory toward graduate school:

> Trying to find out, "Am I able to balance my family life with work?" I guess is the big thing, while trying to also maintain some personal time or ability to maintain my health through the means that I'm used to doing. I guess coming from a background that's not traditionally straight from undergrad into PT and having that work-life [balance] … make sure I'm still somehow [able to] tend to my family and be a relatively good father as well as making sure that I'm able to meet the demands that my patients are bringing forward. (Focus group two, student one)

Participants prioritized self-care and spirituality with an acute awareness of the consequences of neglecting this aspect as captured by student two who said: "I think for me to be successful in this field is finding ways to prevent the concept of PT burn-out and finding new

ways. Not necessarily just keep it fresh but prevent overload with family and work" (Focus group two, student two).

Participants used specific self-care strategies to guide them towards success while in the program as highlighted by student two here: "I've also meditated since I was 14-years-old, and I can honestly tell that that's a big difference in my life because my ability to focus in the moment on a task is much greater" (Pilot, student two). The concept of the multi-faceted vision of success was captured by student one in this excerpt:

> Continue that learning process and continue to develop that clinical experience whether it's in the class, in the clinic or coming back to school and helping out with students, or just learning in the free-time and just experiencing everything that was supposed to be what is our scope of practice and applying that on a daily basis for work and coming back and being able to enjoy the rest of my life whether it's personal or continuing to be a professional. (Pilot, student one)

Students were acutely aware that their attention was being pulled in many different directions and this contributed to the second theme of stability. The theme of stability also captured the effects of SES on REM student experience and priorities. Codes included full-time employment, financial security, and a focused career path. The security of full-time employment was captured by student one who said "I would say having a full-time job is a great success. Being able to pay some loans each month is great. Put food on the table and just kind of continue that learning process" (Pilot, student one). Participants also viewed financial stability as allowing them to meet service goals as captured by student two in this excerpt:

> I want to continue to help on the community level, my volunteer work and internationally, I think financial could be a problem and time off that isn't allocated in the

> U.S. for you to take as much time off as we take for example in Europe. Because you need that, you need that time off to do things like that, so that is a big barrier for sure. You might need to own your own business to be able to be more flexible and for that financial stability. (Pilot, student two)

Exosystem. The theme most evident in the exosystem view was service. Students prioritized serving their communities as captured here: "I hope in the five or ten-year span I've started to strengthen my skill sets that have been taught here and really impact the community … wherever I am" (Focus group one, student five). Another participant shared: "In five years I hope I'm transitioning so that my profession is impacting my community, so maybe I'm starting to think about my clinic and implementing programs that are focusing on health" (Pilot, student two).

Participants' commitment to improving minority communities was articulated by a participant in this excerpt:

> For me, success is being able to help people from my community. There's not a lot of representation, so I feel like I would feel successful when I'm at a point when I'm able to help someone that was in my … position before. (Focus group four, student one)

Participants were acutely aware of the barriers facing non-English speaking patients and envisioned using their bilingual status to increase access to physical therapy for minority patients: "Growing up, when I came here, I had to translate for my parents, and sadly they had a lot of work injuries. So, I feel like if I'm able to help people like that, I'll be successful" (Focus group four, student one).

Participants were aware of the benefits of mentorship in their lives (a facilitator of success) and prioritized giving back to their communities by serving as mentors and role models to other minority students:

> Thanks to my mentors, I was able to succeed and go to college, and also, I have two older sisters. They did go to college, so they helped me a lot. I feel like a lot of barriers are what people think of your group, what people think of your community as a whole, and I feel like that's why we need to give back and be mentors for other students as well. (Focus group four, student one)

Mesosystem. In the mesosystem of the academic environment, students reported appreciating the institution's integrated clinical education model, which allowed for the application level learning (Bloom, Engelhart, Furst, & Krathwohl, 1956) in the authentic clinical environment. When not in the clinic, students reported valuing learning from practicing clinicians in the classroom in small groups. Working in small groups allowed students the opportunity to ask questions in a safer environment. One participant noted about speaking up in a class of 70 students: "It terrifies me. In the big group…they say, there aren't dumb questions, but I'm like 'Well, what if it is a dumb question?'" (Focus group four, student one).

However, also at the mesosystem level, students reported encountering barriers to their success and themes included language and discrimination. It is possible that fear of speaking up in class and comfort in small groups stemmed from decreased confidence with language. Participants who spoke English as a second language reported initially feeling challenged with the technical language in the curriculum: "I feel like the reading sometimes is hard. There are certain words sometimes where I don't know what it is, so I can take a little longer" (Focus group four, student one). One participant described reading a prescribed text and thinking: "Is

this in English?" (Pilot, student two). However, the participant also described eventually overcoming this hurdle: "I could not get what I was reading, but right now I am reading it passionately" (Pilot, student two).

Participants appreciated the need for professional communication with peers and other healthcare professionals, perceived as more challenging than communicating with patients:

> When it comes to speaking professionally to patients I feel like for me, patients, I explain to them more in simple terms which I guess is helping me, but when I'm talking to different professionals I think, okay I need to step it up. (Focus group four, student one)

When communicating with patients, participants saw their bilingual status and tendency to use non-complex terms with patients as both a potential asset and liability: "It really depends on the type of patient. If it's a patient that doesn't have a secondary education, then it's good for them because you actually connect with a patient, but if it's a lawyer, it's definitely a change" (Focus group four, student one).

Additionally, at the mesosystem level, participants reported being subjected to racist remarks, racial microaggressions, and stereotyping. While incidences from one laboratory instructor and one clinical instructor were isolated, microaggressions from peers were commonplace. Participants reported having their accomplishments devalued by peers and attributed instead to race/ethnicity. Stereotyping by majority students was attributed to privilege and upbringing, as captured in this excerpt:

> Especially because we're in doctorate education, you get a lot of people that are very similar in terms of their backgrounds and things, and a lot of people who, through no fault of their own, are privileged. I think a lot of them don't have a lot of interactions with people who don't look like them or act like them. (Focus group three, student one)

However, peers were not solely responsible for racial microaggressions. One participant recounted approaching a clinical instructor in the clinical setting about how she could improve her performance and receiving the following feedback: “She goes, ‘You know, your interventions are very creative but your documentation … you kind of write the way you speak’ And I go ‘What? Wait a minute. There must be a better way to say that’” (Pilot, student two). The participant attributed this behavior to a lack of awareness: "I think it’s lack of training to the staff. We need to know how to voice these things to students without getting personal to their culture or their languages because that is how they’ll take it” (Pilot, student two).

The participant had success in advocating for cultural awareness and competency: “What I did at the end of my clinic, I approached the educational supervisor, and now they include those things on their cultural competence there to not happen again” (Pilot, student two). However, other participants were reluctant to advocate for themselves, especially when confronted with stereotyping by peers. Here a participant describes an incident of stereotyping by a majority peer but being hesitant to respond for fear of conforming to another racial stereotype:

> I was talking, “Oh, I hated summer camp.” And then the guy said to me, “What camp did you do?” And I said, “Oh, I was on the swim team,” and he goes, “Oh, you can swim?” And I said, I kind of laughed because most of the time I tend to just laugh because that’s my way of not being frustrated or not being angry with someone because I don’t want to be seen as an angry Black person or a loud Black person, so I just sort of laughed. (Pilot three, student one)

Microsystem. At the microsystem level, students reported facilitators to success including authentic interactions with faculty and minority peers and finding joy. Faculty were perceived as genuinely committed to student success captured here:

> I think for me; overall, it's just the enthusiasm from all the professors. They're all here engaged in your learning and want you to learn what they have to give, which I think is very important when you're learning from someone that they actually want you to learn, and they're excited about what they're teaching you. (Focus group one, student five)

Viewed as open and accessible to students, one participant said about faculty: "I had plenty of times where I would stop by a professor's office hours or email and in those instances, they were very open to answering my question and offering further help" (Focus group two, student one). Importantly, faculty were also open to talking about cultural differences:

> Faculty were amazing in the sense that we had programs across the campus involving different opportunities to learn about aspects of culture and different patient populations, and literature research that would involve a lot of these cultural aspects that could change how patients receive care or understanding of care. (Pilot, student one)

Participants also valued the support they received from minority peer groups: "I think we could feel open about giggling about our own differences without feeling judged or making anyone else feeling uncomfortable" (Pilot, student two). The shared minority experience allowed students to be their authentic selves as articulated here:

> I can talk a certain way, I can act a certain way, and I know she doesn't look at me differently, and I think in that kind of comfort resides, in people who maybe don't even look like me but culturally have the same kind of background. (Focus group three, student one)

Interactions with minority peers often did not include minority topics but helped control stress levels: "It was always very honest and joyful and always trying to make everyone laugh. It was never about our struggles of being a minority" (Pilot, student two).

Chronosystem. Finally, at the chronosystem level participants struggled with the lack of representation of minority faculty both within the academic institution and the clinical facilities revealing a profession which has been slow to change. Here a participant describes her response to the lack of laboratory instructors of color in the classroom: "I mean, I'm an African American woman, and I don't think we've had a single laboratory instructor that looks like me" (Focus group one, student two). Noting the underrepresentation of professional staff of color in the clinical setting raised questions for participants as well:

> I haven't seen any Black PTs. I haven't seen any Black doctors. So as somebody who's not originally from Boston and came here for school, I know I'm very far from graduating and getting a job, but it makes me think about "Okay, when I graduate is this a place that I want to stay? Is this a place where I go and get a job? Am I going to be the only person who looks like me?" Because that doesn't encourage me to want to stay. (Focus group one, student two)

When participants did have the opportunity to interact with faculty of color, they noted an immediate connection: "I feel like my academic advisor, I do interact with her a lot. And she's also minority, so I feel like I do feel the connection right away" (Focus group four, student one). However, racial and gender incongruence with faculty contributed to feelings of isolation and presented an additional barrier to success:

> I remember going to my advisor, and it wasn't anything against, okay well, there was a couple things. One, he is a male, he is a White male and just kind of relating some of the things that I have issues with as being someone who is a Black female, first-generation, like the things I have struggled with. How do I voice that to someone who probably won't understand? I think that was my biggest challenge, going through my first year

having a problem and not having someone who I can relate that to. (Focus group one, student five)

Here the participant captures feelings of isolation being unable to communicate honestly with an academic advisor due to differences in race and gender. The participant reports that ultimately the issue remained unresolved highlighting the important of racially congruent mentors who can appreciate minority student unique experience in a physical therapy program. Themes are organized and presented according to the EST (see Table 2.7). The next section will detail how the researcher attempted to ensure credibility in the data analysis process.

Credibility. Researchers select from member checking, triangulation, thick descriptions, peer reviews, and external audits to work toward validity in qualitative inquiry (Creswell & Miller, 2000). In this research study there was the potential for data triangulation with the use of performance data, campus climate and graduate exit surveys, as well as survey data and focus group interview transcripts. Additionally, as the researcher adopted a constructivist paradigm (Denzin & Lincoln, 1994), during thematic data analysis, thick, rich descriptions were used to work towards credibility in this analysis. As a racial ethnic minority employed at a predominantly White institution, the researcher was challenged to remove all bias from the analysis process, so vivid descriptions of the participants and the context were employed to allow the reader to envision the setting and be transported to the situation. The added benefit of rich descriptors is the potential generalizability of results, as qualitative research findings can be applied across contexts if the reader has enough detail about the study context (Twining, Heller, Nussbaum, & Tsai, 2017).

Table 2.7

Focus Group Interview Themes Organized by Ecological System

Ecological System	Themes	Codes	Perceived as success or facilitator or barrier to success
Macrosystem	Balance	Family	Facilitator
		Work	Facilitator
		Self-care/spirituality	Facilitator
	Stability	Full Time employment	Success
		Financial security	Success
		Focused career path	Success
Exosystem	Service	Community	Success
		Increasing access	Success
		Mentoring minority students	Success
		Giving back to the profession	Success
Mesosystem	Application	Clinical education	Facilitator
		Safe spaces	Facilitator
		Patient interactions	Facilitator
	Language	Bilingual status	Facilitator/barrier
		Technical language of the curriculum	Barrier
	Discrimination	Stereotyping	Barrier
		Microaggressions	Barrier
		Segregation	Barrier
Microsystem	Authenticity	Relationships with faculty	Facilitator
		Relationships with minority peers	Facilitator
		Joy	Facilitator
Chronosystem	Lack of representation	Academic and clinical faculty	Barrier
		Shortage of minority role models	Barrier
		Isolation	Barrier

Analysis of Mentorship Survey

Thirteen students (eight female and five male students) completed the online survey on mentorship in DPT education. Students self-identified as White (n=8), Asian (n=2), African American (n=1) and Other (n=1). One student declined to specify race. All respondents except for one reporting having a mentor. Sources of mentors ranged from connecting via social media, being assigned by the program, and meeting in the clinical setting. Students were able to differentiate between advisors and mentors as captured by one respondent in this excerpt:

> An advisor is there to provide advice when necessary, while a mentor goes beyond that. You develop a relationship with a mentor that can last a lifetime and gain mutual respect for each other as this connection grows (Participant seven).

Frequency of communication with mentors varied from daily to a few times a year. The theme of balance emerged from the mentorship survey responses as well with one participant saying about her mentor: “She advocates for herself and has as healthy as possible of a work-life balance, which was something that I learned a lot from in my time working with her” (Participant four). Overall, mentors were a positive guiding force captured in this excerpt by one respondent:

> They provide positive reinforcement for questions and curiosity while also maintaining a fun, positive atmosphere for learning. Also, their energy and charisma for teaching is evident and motivating. They don't just answer my questions outrightly all the time. They facilitate my own learning by having me think about it and attempt to answer my own questions through appropriate rationale (Respondent fourteen).

Discussion

Like academic outcomes in other health sciences fields, such as nursing (Cantwell, Napierkowski, Gundersen, & Naqvi, 2015), REM DPT students have a lower chance of degree attainment than their White counterparts (Williams et al., 2015). This study confirmed inequitable outcomes for REM DPT students, with race being associated with both academic difficulty and increased time for degree completion, which has significant financial implications (Coleman-Salgado & Barakatt, 2018). The higher percentage of REM students who withdrew from the program over the four-year study period also warrants further investigation.

Much of the research on REM students in PT programs have been quantitative, limiting insight into the lived experience of minority DPT students (Naylor et al., 2014; Utzman et al., 2007a; Utzman et al., 2007b; Williams et al., 2015). This study offered insight into REM student's experience in a DPT program and the influences from chrono- to microsystem on student success. At the macrosystem level, achieving financial security was a priority, consistent with REM students who express concerns with affording and sustaining a nursing education (Diefenbeck, Michalec, & Alexander, 2016). At the mesosystem level, findings of a lack of cultural competence among peers mirror the experiences of students in nursing (Diefenbeck et al., 2016; Murray, 2015), speech and language pathology (Ginsberg, 2018), and genetic counseling programs (Schoonveld, Veach, & LeRoy, 2007).

Qualitative data analysis of campus climate and student exit surveys revealed that students valued supportive faculty but perhaps did not leverage all faculty support services available to augment their success. Peers were found to be less supportive than faculty. These findings were supported by the analysis of focus group data. Facilitators to success at the microsystem level included authentic interactions with faculty and minority peers. The ability to

ask questions of peers without the fear of being judged is identified as critical to doctoral student success (Terry & Ghosh, 2015). In this study, REM DPT students found a safe space with other students of color and in small group work. Students felt connected to faculty of color but noted the lack of representation both within the academic and clinical settings as barriers to their success. Nuciforo (2015) found that African American and Hispanic applicants are more likely to apply to a DPT program with a REM faculty member and less likely to apply to a program without a REM faculty member. Notable is that programs were classified as having REM faculty if they had one or more REM faculty members (Nuciforo, 2015). This classification system speaks to the underrepresentation of REM faculty in physical therapy higher education, reinforcing the problem of practice. Additionally, there are clear challenges facing REM physical therapy faculty who wish to mentor REM students but are greatly outnumbered on their campuses.

Limitations

Limitations included a sample of students at one academic institution. When compared with aggregated data on physical therapy programs in the U.S. (CAPTE, 2018), the sample in the quantitative arm of the study was more racially and ethnically diverse, impacting the generalizability of results. The sample was further limited by a large percentage of students about whom race and ethnicity is unknown. Few students completed the campus climate survey, graduate surveys, and online mentorship survey. Demographic data is inconsistently collected on the campus climate and graduate surveys, although existing data reveals a mostly White participant group.

While focus group interviews included a small sample of students at one academic institution, groups included representation across gender, race groups, and year of study.

However, interviews were conducted by the primary researcher, a faculty member at the institution under study, and the perceived power differential between faculty and students may have impacted participant responses. Additionally, as a woman of color employed at a predominantly White institution, the researcher is challenged to remove all bias from the analysis process. While strategies were employed to ensure credibility in the data analysis procedures, future research may benefit from an external auditor to the coding process.

The small sample of REM students who consented to participate in focus group interviews warranted analyzing interview data together as opposed to by individual race group. Minority groups are not homogenous, and facilitators and barriers to success may differ by racial and ethnic group (Diefenbeck et al., 2016; Ginsberg, 2018). Other researchers have been able to compare the experience of African American and Hispanic nursing students, for instance, and found cultural differences in the impact of families on student success (Bond, Cason, & Baxley, 2015). Future work with a larger sample may benefit from analysis of individual groups to gain greater insight into racial and ethnic minority group needs.

Conclusion

Ultimately, physical therapist students from racially and ethnically diverse backgrounds with multilingual capabilities will be an asset in the health care industry, as the provider may be fluent in one of the languages spoken by a diverse patient population (Dillon & Tomaka, 2010). Despite barriers to success, REM students in this study prioritized increasing access to care for communities of color by providing bilingual patient care. Students also valued mentoring other students of color. However, study findings confirmed inequitable outcomes for REM DPT students and offered some insight into the experience of REM DPT students in a predominantly White institution. In addition to completing rigorous academic curricula, REM DPT faced

multiple barriers to their success. One self-perceived barrier to success at the chronosystem level was related to a shortage of minority role models who can appreciate minority students' experiences within racialized academic institutions, highlighting the need for REM core and clinical faculty. The cause of REM DPT student inequitable outcomes is complex, with many potential areas for targeted interventions.

Chapter 3: Intervention Literature Review

As minority students must reach critical mass to feed the supply of a diverse healthcare workforce and feed the supply of REM faculty (Chisholm-Burns et al., 2012), the success of all students enrolled in health science programs is imperative. However, as discussed in Chapter 2, analysis of performance data confirmed that minority status is associated with both academic difficulty and increased time to degree attainment, which has significant financial implications (Coleman-Salgado & Barakatt, 2018). REM DPT students' perceived barriers to success included language and culture, microaggressions and stereotyping, and a shortage of minority role models. The findings of the needs assessment study outlined in Chapter 2 are consistent with the literature describing the minority student experience in higher education (Ackerman-Barger et al., 2016; Daniel, 2007; Ramirez, 2017) where cited barriers to success include racial discrimination (Daniel, 2007), social isolation (Ramirez, 2017), and stereotyping (Ackerman-Barger et al., 2016).

This chapter will focus on the intervention literature, which addresses supporting REM student success in higher education. Theoretical frameworks that frame the potential interventions are described first. The intervention literature is then presented as cognitive and non-cognitive factors. Cognitive factors include analysis of interventions related to language and dialect, a culturally responsive curriculum, and mitigating stereotype threat. Non-cognitive factors deal with the connection between social belonging and academic achievement. Interventions to promote social belonging, such as advising and mentoring follow. Both traditional and non-traditional forms of mentoring are explored. Finally, the proposed intervention is presented.

Theoretical Frameworks

The theoretical frameworks which situate this intervention literature review include community cultural wealth (Yosso, 2005) and the racial/cultural identity development (R/CID) model (Sue & Sue, 2012). Yosso (2005) critiques the assumption that only the knowledge of the upper and middle class is valued as capital and challenges the view that racial and ethnic minority persons lack the social and cultural capital needed for success. Community cultural wealth (CCW) posits that families and communities play a central role in the lives of minority students and includes the forms of capital (aspirational, navigational, social, resistant, familial, and linguistic) which REM students bring from their communities into the classroom (Yosso, 2005). Each of the six CCW forms is interconnected (see Figure 3.1), build on one another, and are explored in detail next.

Community Cultural Wealth

Linguistic capital describes the cognitive and social skills which draw upon having communicated in more than one language. Yosso (2005) emphasizes that students of color present to the educational institution with many communication skills and a rich background of storytelling tradition. The strengths associated with this linguistic exposure include attention to detail, memorization, as well as skills leveraging tone and affect. Students of color may serve as translators for their parents, requiring cross-cultural awareness, familial responsibility, and teaching and tutoring skills (skills especially relevant for future physical therapists). The familial responsibility associated with linguistic capital is linked to the next form of capital. *Familial capital* is the form of cultural knowledge nurtured by family, which emphasizes a commitment to community well-being (with community seen as the extended family).

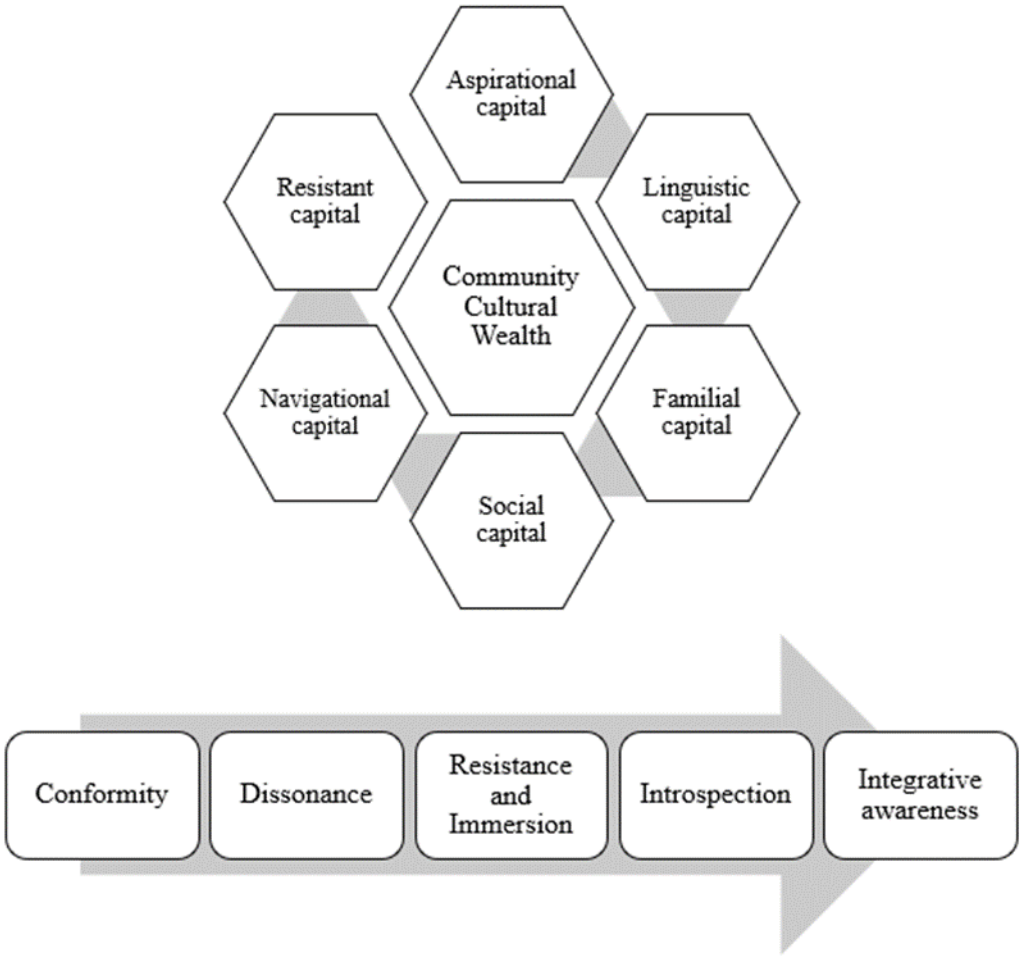

Figure 3.1 Community cultural wealth (Yosso, 2005) emphasizes the forms of capital that minority students bring into the classroom and their mentoring relationships. Racial/cultural identity development model (Sue & Sue, 2012) highlights the unique mentoring needs of REM students in higher education.

Social capital comprises the networks of people REM students rely on to obtain information, access resources, and for emotional support. Of importance are the peer and social contacts that provide emotional support to navigate social establishments (Yosso, 2005) such as institutions of higher education. The reliance on social capital emerged from the needs assessment as being vital to REM student success while enrolled in a DPT program and may

warrant special attention in a potential intervention. Social capital theory based mentoring interventions (Lewis et al., 2016) will be presented as part of the intervention literature.

Navigational capital describes the ability to advance through social institutions not designed with persons of color in mind. Faced with racialized institutions of higher education, persons of color must utilize social networks and resilience to succeed. *Aspirational capital* encompasses persons of color ability to maintain their positive expectations for the future despite being faced with actual and perceived barriers to success. The final form of CCW, *resistant capital,* highlights students of color learning to value themselves and assert themselves because of this awareness (Yosso, 2005).

The benefit of CCW as a framework for this study is that Yosso (2005) moves away from conceptualizing racism as binary and focusing only on Black and White but instead includes the racialized experiences of women, Latina/os, Native American, and Asian Americans, who are also the focus of this intervention study. CCW also deemphasizes a deficit model but instead encourages educators to focus on building on assets that are common in communities of color to empower REM students to succeed (Yosso, 2005). Asset-based interventions will be the focus of this literature review.

Racial/Cultural Identity Development

The second theoretical framework which situates the intervention literature review is the R/CID model which conceptualizes REM persons on a development continuum as they seek to understand themselves and their culture in relation to the dominant culture and describes the development of the minority person towards a state of acceptance of their racial/cultural identity (Sue & Sue, 2012). During the first stage of the R/CID model, *conformity,* the REM student faces the pressure of assimilation and acculturation and prefers the values of the dominant culture to

their own. In the second stage, *dissonance*, the REM student begins to acknowledge the positive aspects of their culture and becomes aware that not all aspects of the dominant culture are positive. In the *resistance and immersion phase*, the REM student feels increased respect for minority values and rejects the dominant culture. In the *introspection* phase, the REM student has a beginning awareness of the experiences of other oppressed groups but also gains an appreciation for what might be valuable in the dominant culture. In the final stage of *integrative awareness*, the REM student appreciates the unique aspects of their own culture and the dominant culture and perceives themselves at a group level of identity but also as a member of society (Sue & Sue, 2012).

In higher education, the R/CID model may be useful when considering the mentoring students of racial/ethnic minority backgrounds and understanding the role that oppression may have played in the REM students' development. Figure 3.1 highlights the link between the two frameworks. Regardless of where the REM students fall in the R/CID continuum, the students bring their CCW into the mentoring relationship. Mentoring interventions will be presented later in the literature review.

Literature Review

This literature review will synthesize the research related to supporting racial and ethnic minority students enrolled in academically rigorous graduate programs such as physical therapy. A driver diagram (Figure 3.2) highlights the primary and secondary drivers as the key levers for productive change and the change ideas which informed the proposed intervention (Bryk, Gomez, Grunow, & LeMahieu, 2015).

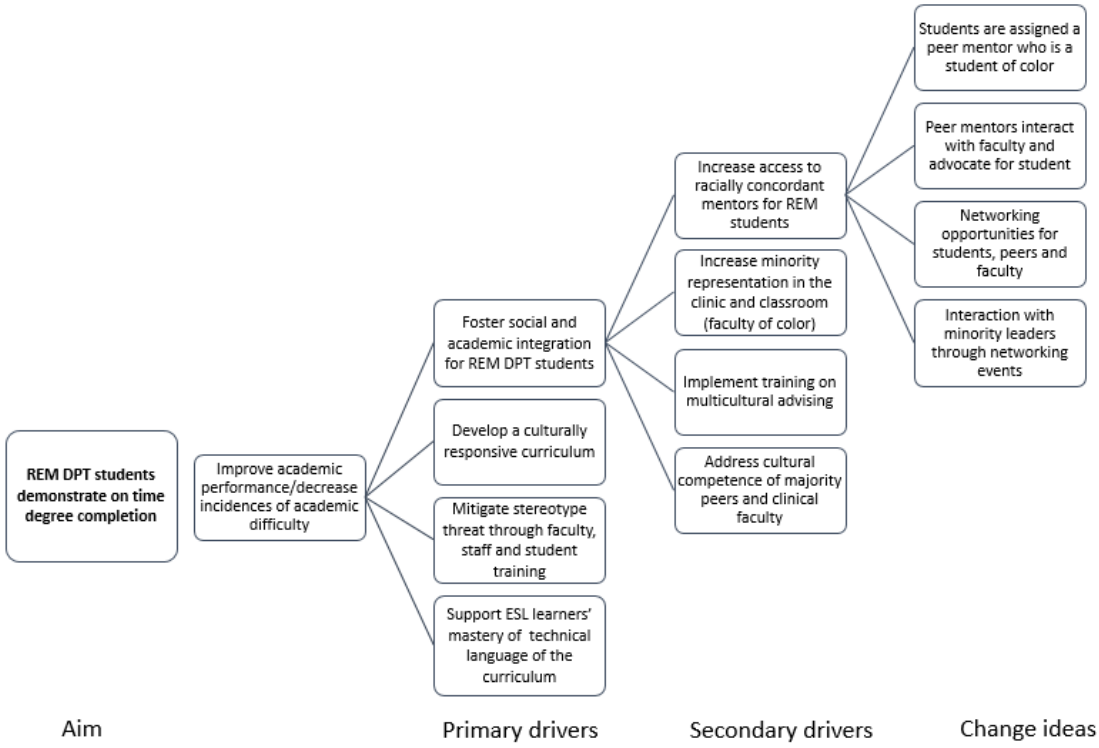

Figure 3.2 Primary and secondary drivers to facilitate on-time degree completion for racial and ethnic minority students in a Doctor of Physical Therapy Program. Adapted from Bryk et al., (2015)

In the needs assessment, REM DPT students reported being motivated to use their bilingual status to increase access to physical therapy for minority patients. However, students who did speak English as a second language (ESL) also identified language as a potential barrier to their success while enrolled in a physical therapy program. For this reason, research related to the challenges of language and dialects in physical therapist education is presented. Minority students also reported incidences of cultural isolation in the DPT classroom and the motivation to return to minority communities to effect change. Interventions related to a culturally responsive curriculum are also synthesized.

Additionally, REM DPT students reported facing stereotyping by peers and, at times, clinical faculty. Interventions related to mitigating stereotype threat are described. After that,

much of the intervention literature will focus on a key primary driver: fostering social and academic integration for REM students in higher education. The mentoring needs of minority students and interventions related to mentoring programs aimed at supporting racial and ethnic minority students are synthesized. Finally, a brief overview of the proposed intervention, a networked mentoring model, is presented.

Supporting Racial and Ethnic Minority Students

As described, this intervention literature review is framed within the CCW (Yosso, 2005) framework. Latina/o students enrolled in health professions programs demonstrate the ability to convert sociocultural assets into the types of capital needed to succeed in graduate school. Zell (2014) found that students were able to convert aspirational and linguistic capital into degree completion and used their bilingual status to make connections with other minority students. It is evident that non-traditional and non-material forms of capital (such as linguistic capital) are vital to minority student success in graduate school as they can be converted into the types of capital which promote positive educational and occupational outcomes (Zell, 2014). Continuing with the theme of leveraging linguistic capital, interventions related to language and dialects are discussed further.

Language and Dialects in Physical Therapist Education

In addition to the racial and ethnic diversity of the U.S. population, it behooves healthcare educators to consider the linguistic diversity of our patient population. Nearly 20% of the U.S. population speaks a language other than English at home (U.S. Census 2000, 2019). Ultimately, CLD physical therapist students with multilingual capabilities can be an asset in the health care industry, as it means that the provider may be fluent in one of the languages spoken by a diverse patient population (Coleman-Salgado & Barakatt, 2018). However, having ESL has

been found to be a predictor of failure on the national physical therapy examination (NPTE; Coleman-Salgado & Barakatt, 2018). Physical therapy students must pass the NPTE to practice as licensed clinicians in the U.S. However, between two to three percent of students fail to pass the NPTE and do not meet their goal of practicing as a clinician, failing to reap the financial benefits of employment as a physical therapist (Coleman-Salgado & Barakatt, 2018). As the NPTE is a timed examination comprised exclusively of multiple-choice questions, the next section will explore the challenges ESL learners face with multiple-choice questions. Potential interventions are presented after that.

Mitigating the bias of multiple-choice questions. The use of multiple-choice questions has increased in higher education in response to increased student enrollment and because of the relative ease and reliability afforded to faculty. However, faculty may be sacrificing validity for reliability, as multiple-choice questions test recall and not necessarily critical thinking (Paxton, 2000). While the program under study emphasizes application-level questions (Bloom, 1956), even application-level questions do not necessarily test higher-level thinking (Paxton, 2000). Multiple-choice questions facilitate surface level rather than deep level learning because students do not generate an idea; they select an answer (Paxton, 2000). However, when students are forced to produce writing and ideas, they make connections and demonstrate an understanding of the content. Aside from the plethora of written assessments, students also need the opportunity for communicative discourse (Paxton, 2000). This is a strength of physical therapy programs in general that utilize both practical examinations and clinical experiences in the authentic environment to allow students to reason through procedures with patients and their mentors (Lyons et al., 2017).

At a DPT program in a Hispanic institution serving a 74% Hispanic student body, ESL status predicted failure on the NPTE (Dillon & Tomaka, 2010). Dillon and Tomaka (2010) highlight that tests written in English test language proficiency as well as curricular content and advocate for early identification of students at risk for failure and the provision of supplemental support. However, Banks (2015) cautions against essentializing and making assumptions about a group based on gender, race, or ethnicity. This presents a challenge to physical therapy faculty seeking to support English language learners in their programs. Interventions related to language development strategies are presented next.

Language development strategies. Vocabulary development is vital for the complex discipline-specific language necessary for success in a DPT program (Hussin, 2009). However, there is a paucity of literature on supporting ESL DPT students. The nursing literature offers some strategies. Fuller (2013) advocates that students should have access to a medical terminology class and glossary for frequently used medical terms, compiled by faculty.

Additionally, students should be encouraged to log unfamiliar terms, and faculty should consider offering CLD learners who are English language learners the use of bilingual dictionaries for written examinations during the first year of study. As the national physical therapy examination does not allow for the use of bilingual dictionaries, gradually tapering the use of support during written examinations should be a priority. Additional strategies to scaffold a DPT program are presented next.

Scaffolding a DPT program. Between 2014 and 2016, the DPT program at Howard University reported a 60.8% pass rate on the national physical therapy examination (NPTE). This resulted in the program being placed on probationary status (Greene & Karavatas, 2018) as accreditation standards stipulate that DPT programs average an 85% pass rate on the NPTE to

maintain accreditation status (CAPTE, 2017). University leadership instituted the following interventions to address the poor NPTE pass rate: (a) a change in admissions policy with minimum required scores on the graduate record examination, (b) the addition of two summer sessions to bolster the academic curriculum, (c) a remediation program for students scoring lower than 80% on a written or practical examinations, as well as (d) academic boot camp for all third-year students, with free access to practice examination and assessment tests (Greene & Karavatas, 2018). After these interventions were instituted, the program exceeded the 85% pass rate. It regained full accreditation status (Greene & Karavatas, 2018), illustrating that health care educators can use specific criteria to identify students at risk of academic difficulty and failure without essentializing all REM or ESL DPT learners.

While interventions to address academic difficulty may include frequent high stakes testing (Greene & Karavatas, 2018), faculty can opt to use multiple-choice question quizzes not only as a summative tool but as a formative tool as well (Paxton, 2000). For CLD learners, multiple-choice questions could be leveraged as a language awareness-raising exercise. A think-aloud protocol with concurrent feedback on the incorrect response immediately after the test could help the CLD learners explore nuances and subtleties in test questions (Paxton, 2000). Ultimately, implementing multicultural education in higher education warrants a paradigm shift and appreciation for the complexity of culture and language (Solano-Flores & Trumbull, 2003). Valid and equitable testing for CLD learners who are outside of the mainstream culture must be prioritized, and a culturally responsive physical therapist education curriculum implemented.

Implementing a Culturally Responsive DPT Curriculum

Culture is defined as "behaviors and values that are learned, shared, and exhibited by a group of people" (Yosso, 2005, p.75) and is a form of social history and identity. However,

culture can also refer to the social glue that binds institutions and campus culture is a key factor in an institution of higher education's ability to foster the success of REM students (Museus, 2011). Multicultural education is multi-faceted, encompassing culturally responsive teaching, consideration for how culturally and linguistically diverse (CLD) learners construct knowledge, and promoting prejudice reduction and an equity pedagogy, as well as an empowered school culture (Banks, 2015). All students should have equal opportunities to learn (Gee, 2008) and achieve their highest academic outcome, and educators are encouraged to design curricula that highlight relevant cultural metaphors that build on background knowledge that CLD learners have (Banks et al., 2001). Banks (2015) describes the equity pedagogy as one where instruction provides all students with an equal opportunity to attain academic and social success in school. As highlighted, this is not the case in physical therapy higher education nationwide (Utzman et al., 2007a; Utzman et al., 2007b).

The classroom observation at the institution under study revealed that developing a culturally responsive and relevant physical therapy curriculum is potentially an area for development (Naidoo, 2018). The absence of a culturally relevant curriculum, which fails to include minority issues and perspectives, negatively influences minority students' professional socialization (Daniel, 2007). Additionally, a lack of culturally diverse perspectives in the curriculum contribute to minority students challenge with connecting with White faculty (Fries-Britt & Turner, 2002).

To teach a group of 106 culturally diverse interprofessional health care students (including nursing and physical therapist students), an educational innovation included low stakes written assignments (such as journal reflections about heritage), case-based discussions about cultural issues, and a short multiple choice question exam (Hawala-Druy & Hill, 2012).

Case studies were related to both the profession and the diverse cultures of the surrounding community and student body. At the end of the course, students expressed an appreciation for understanding their own cultures, including bias and stereotypes (Hawala-Druy & Hill, 2012), highlighting the value of multiculturalism in the classroom.

The intervention by Hawala-Druy and Hill (2012) highlights that institutions often focus on content integration and an additive approach to multicultural education. However, faculty should consider the knowledge construction aspect of multicultural education. Banks (2015) highlights that knowledge should be thought of as a social construction process, and students should be guided towards how cultural assumptions and frames of reference influence knowledge construction. Here, the constructivist approach to learning may be particularly relevant.

Merriam and Kim (2008) highlight the benefits of embracing a non-Western view of learning and that there are different ways to approach learners who have a non-Western view of learning. The authors offer that learning is holistic, lifelong, informal, and communal. Santamaria (2009) emphasizes that heterogeneous group work is a key aspect of culturally responsive teaching as it offers the opportunity for students to learn from a variety of people, including peers, fostering the development of intergroup relations. DPT programs looking to embrace multicultural education would be well suited to facilitate small group work cited by minority students in the needs assessment as a facilitator to success. Communal learning also emphasizes that CLD learners learn not only for their gain but to contribute to society (Merriam & Kim, 2008). In the needs assessment, minority students expressed being motivated to return to their home states and effect change. However, students did not have access to resources in the

DPT program to facilitate working with minority communities. A social entrepreneurship focus may help to facilitate communal thinking in DPT curricula.

Social entrepreneurship describes endeavors motivated to provide sustainable solutions to societal problems (Archibald, Muhammad, & Estreet, 2016). Mair and Noboa (2006) highlight that social entrepreneurship can deliver innovative solutions to many domains, including health, making this framework relevant to a physical therapy program. Social entrepreneurship is conceptualized as a venture where the entrepreneur engages in opportunity-based activities to make a difference in society (Mair & Noboa, 2006). A social entrepreneur is "Distinct from a business entrepreneur who sees value in the creation of new markets, the social entrepreneur aims for value in the form of transformational change that will benefit disadvantaged communities and, ultimately, society at large" (Skoll Foundation, n.d., para. 2.). Social entrepreneurs are creative, passionate individuals with a clear vision for their endeavor, who seek to make both social and economic gains (Mair & Noboa, 2006). Age also appears to play a role in motivating entrepreneurial endeavors, with young adults between the ages of 25 and 34 being highly motivated to create entrepreneurial ventures (Minniti, Bygrave, & Autio, 2006). The key characteristics shared by social entrepreneurs are empathy and the “relentless motivation to change a whole society” (Mair & Noboa, 2006, p. 123). Given the age and motivation of the average physical therapist student, social entrepreneurship may be well-positioned within an allied health sciences program (Archibald et al., 2016).

Multiculturalism is described as the number one unresolved issue in higher education, highlighting that a diverse campus does not automatically foster multicultural attitudes and values (Gordon, 2005). The literature on multicultural education in physical therapy focuses on developing culturally competent physical therapists to treat diverse patients (Reicherter et al.,

2007) but fails to address how to support CLD learners enrolled in PT programs. A conceptual model for U.S. physical therapy faculty who wish to teach abroad is presented and framed as cross-cultural education (Michajlyszyn, Thompson, Stiller, & Doherty, 2012), failing to consider the cross-cultural education that takes place in physical therapy classrooms in the U.S.

The paucity of literature on multiculturalism in physical therapy highlights that there is much work to be done in supporting CLD learners in DPT programs. Physical therapy faculty are cautioned to consider that providing scaffolding for CLD learners has the potential to negatively impact CLD learner test performance by drawing attention to race. Stereotype threat can result in minority students distancing themselves from the educational experience, thereby decreasing motivation and educational success (Steele & Aronson, 1995). The next section will explore the concept of stereotype threat and address mitigating this barrier through training and shaping theories of intelligence.

Stereotype Threat Susceptibility

Stereotype threat negatively affects the intellectual test performance of high achieving REM students, mainly when the stakes are high, and attention is drawn to students' racial background (Steele & Aronson, 1995). Minority students in health professions programs are at risk of not reaching their full academic potential (Ackerman-Barger et al., 2016) as stereotype threat can negatively impact academic performance by impairing working memory and inhibiting intellectual test performance (Steele & Aronson, 1995). However, faculty struggle with how best to support minority students in health professions programs and are unsure of what can be done to optimize challenging learning environments (Ackerman-Barger et al., 2015).

Faculty must first appreciate that minority students have a vastly different educational experience compared with their majority peers (Ackerman-Barger et al., 2015; Daniel, 2007).

While all students in the health sciences are challenged by rigorous curricula, minority students must also deal with internal struggles such as stereotype threat, internalized bias, and microaggressions (Ackerman-Barger et al., 2015). When Black students are praised by White faculty for meeting minimal expectations, students perceive the praise to indicate low expectations based on stereotypes (Guiffrida, 2005). To help mitigate stereotype threat, Gay (2012) encourages setting high standards for all learners. Faculty are advised to avoid lowering standards for REM students and should instead offer feedback which reinforces the confidence that the REM student can meet high standards (Steele, 2010). Black students report finding being held accountable for quality work and pushed to excel by faculty as empowering, as it emphasizes faculty belief in minority students' ability to succeed (Guiffrida, 2005).

To raise awareness about stereotype threat and to provide strategies to reduce or eliminate stereotype threat in the classroom, faculty at Valparaiso University, IN, hosted a lecture and developmental workshops for faculty, staff, and students. Students were also invited as part of the intervention, as students who are aware of stereotype threat are less likely to suffer from it (Schmitt, Mooradian, & Hedlin, 2017). Outcomes included lecture attendance and analyzing pre and post-workshop surveys. However, while survey responses indicated that faculty and staff felt "fairly skilled" (Schmitt et al., 2017, p. 109) at avoiding stereotype threat in the classroom, the true impact of the intervention on students susceptible to stereotype threat remains unknown. Future research may benefit from the use of an outcome measure post-intervention such as the Social Identities and Attitudes Scale, a validated tool that measures stereotype threat (Picho & Brown, 2011). Faculty may also be able to employ strategies to mitigate stereotype threat into their advising sessions with REM students.

While the primary drivers outlined in Figure 3.2 help identify a small set of key improvement hypotheses, these drivers are admittedly too general. Instead, secondary drivers are conceptualized as the key levers for productive change (Bryk et al., 2015) to address the problem of practice. The secondary drivers (see Figure 3.2) are explored next. Interventions related to non-cognitive factors such as advising and mentoring are described after that.

Non-Cognitive Factors and Minority Student Success

The theory of university departure (Tinto, 1993) highlights academic and social integration as the two most vital determinants factors in the retention of students in higher education. Academic factors include GPA, intellectual development, and student perception of faculty concern (Tinto, 1993). Students of color report that interacting with minority faculty mentors help introduce them to the unwritten norms and rules of the profession, models effective professional behavior, and improves their social capital by introducing them to a significantly different network (Davis, 2007). Social integration factors include self-esteem, relationships with peers, and informal interactions with faculty - particularly the quality of the interactions with peers and faculty (Tinto, 1993). Social connections can impact cognition in a variety of ways (Walton, Cohen, Cwir, & Spencer, 2012), and when there is decreased social connectedness, intellectual functioning is impacted (Baumeister, Twenge, & Nuss, 2002). Therefore, key concepts related to social belonging are explored next.

Social belonging and academic achievement in higher education. Social belonging is conceptualized as perceived positive relationships with others. Notably, it is the perception of the quality of relationships that impacts wellbeing, more than the number of relationships (Walton & Cohen, 2011). Social belonging includes factors such as shared experience, values, and feedback (Walton et al., 2012). Here the link is made between social belonging and community cultural

wealth, particularly social capital, which emphasizes the importance of networks of people and community as contributing to minority student success (Yosso, 2005). At the other end of the continuum from social belonging is social isolation. Students who transition to a new academic environment may experience isolation, social setbacks, and perceived lack of belonging (Walton & Cohen, 2011). Social isolation has the potential to negatively impact academic outcomes as loneliness, and low social status can lead to a poorer perception of well-being and harm intellectual achievement and health (Walton, 2007). Both these factors highlight the value of intervening on students in the first year of a graduate program.

It is, therefore, possible that social connectedness, even with relative strangers, can shape achievement motivation and encourage participants to adopt the ambition of others (due to the social transmission of goals; Walton et al., 2012). Walton et al. (2012) conducted a series of experiments to determine whether *mere* belonging (a precursor to social belonging) could affect motivation behavior of a population of undergraduate students. Students who were provided with a positive math role model or socially linked to the role model (by sharing a birth date) showed persistence in attempting to solve an unsolvable math puzzle and demonstrated increased motivation to pursue math. When linked with other students who were labeled as puzzles persons, students again showed increased persistence in attempting to solve the unsolvable math puzzle. In the fourth and final experiment, participants with social connectedness to an unfamiliar person adopted the other person's goal as their own and dissociated from the goal after it was attained. Researchers concluded that even a sense of social connectedness with small trivial cues increases motivation, highlighting the importance of social relationships in achievement motivation (Walton et al., 2012) and the importance of community cultural wealth (Yosso, 2005) and social capital. While social identity threat can convey to students that they do

not belong and undermine motivation, a sense of belonging to an intellectual community can buffer these effects. Additionally, long-standing relationships may have an even more profound effect on raising motivation in applied settings (Walton et al., 2012).

To assess the effect of social belonging on long term academic and health outcomes, Walton and Cohen (2011) studied cohorts of African American (n=49) and European American (n=43) students in the second semester of their first year in an elite institution of higher education. The intervention included a narrative that highlighted social adversity as a shared but short-lived experience. Students were encouraged to view the adversity as a common but temporary aspect of the college-adjustment process and not unique to their attributes. Students then wrote an essay about their experience at college to date, echoing the message of the narrative, and then filmed a video of their speech (which participants believed would be shown to future students). The video exercise reinforced the message of the narrative and reframed participant self-perception as benefactors and not recipients of an intervention. (Students in the control group completed the same process with narratives unrelated to social belonging). African American students in the control group showed no improvement in GPA over the three years but those in the intervention group showed a GPA that rose over time. The GPAs of European American participants also increased over time. By senior year, the achievement gap between the intervention group and their European peers was cut by 79% and increased the number of African Americans earning post-intervention GPAs in the top 25% of their class. Researchers attributed the treatment effect to African American students buffering themselves against adversity (monitored through daily surveys completed after the intervention). The intervention group also reported being healthier and consulting their doctor less frequently than the control

group, concluding that a brief social-belonging intervention can improve academic performance, health, and well-being of REM students over three years (Walton & Cohen, 2011).

Both studies (Walton & Cohen, 2011; Walton et al., 2012) used role models to increase academic motivation and achievement. The value of role models (both faculty and peer) is discussed further with regards to mentorship. Interventions targeting non-cognitive factors in minority student success, including faculty advising and mentorship, are explored next.

Advising in the Health Professions. At one health sciences program, only 17% of physical therapy and occupational therapy students met with their advisor within a month of starting the academic program (Barnes & Parish, 2017). Of those students who did not seek out their advisor, 76% reported feeling that connecting with their advisor early would have been beneficial. In a two-phase quality improvement initiative, Barnes and Parish (2017) found a significant correlation between increased contact with a faculty advisor and perceived benefit to the student. The authors recommend early and often academic advising to establish a productive relationship between advisor and advisee (Barnes & Parish, 2017).

Faculty of color in STEM share the opinion that mentoring and advising are vital to continuing success in STEM fields (Griffin et al., 2010). In a mixed methods study examining the factors which facilitated Black professors' success in STEM fields, professors reflected on their mentoring experiences with undergraduate professors, advisors, and older colleagues. Mentors were either the same-race or White, but regardless of race, participants expressed that having mentors who believed in their potential to be successful was vital to their development. Participants described experiences beyond traditional advising for academic coursework that included being encouraged to network and explore research opportunities. These opportunities

eventually helped faculty identify areas of future scholarship, find jobs and, ultimately, achieve tenure (Griffin et al., 2010).

Physical therapist and occupational therapist students stress that focus on aspirations and growth beyond academic performance improves satisfaction with advising (Barnes & Parish, 2017). While advising in the health sciences encompasses more than course planning but instead focuses on supporting academic success (Harrison, 2009), academic advising is still distinct from mentorship. Mentorship describes the partnership where knowledge, skills, and information are shared to facilitate a mentee's professional growth and development (Wright-Harp & Cole, 2008). The next section focuses on the role of mentoring in fostering minority student success in higher education.

A Focus on Mentorship. Mentorship is frequently leveraged as an intervention to increase the recruitment and retention of minority students in higher education (Davis, 2007; Kendricks & Arment, 2011; Kendricks, Nedunuri, & Arment, 2013; Kosoko-Lasaki, Sonnino, & Voytko, 2006; Lewis et al., 2016; Wilson, Sanner, & McAllister, 2010). African American undergraduate students who choose to persist have higher perceived social support from family and friends, greater perceptions of being mentored, increased cultural congruity, a more positive perception of the university environment, and higher self-esteem. The strongest predictor of persistence was being mentored by someone at the academic institution. Researchers hypothesized that these factors, particularly mentorship, could buffer negative experiences for minority students on campus (Gloria, Kurpius, Hamilton, & Willson, 1999).

Despite the remote origin of the word mentor (Miller, 2002), there is a lack of clear conceptualization of the term as well as a lack of theory to capture the roles and responsibilities associated with mentoring (Crisp & Cruz, 2009). As defined in business, mentoring involves a

more knowledgeable person overseeing a less experienced person to facilitate career development and advancement. In psychology, the focus is on the psychosocial development of the mentee through the provision of emotional and moral support (Crisp & Cruz, 2009). The International Mentoring Association (2003) defines mentoring as a complex process used to guide a protégé through career transitions and as a necessary part of training effective, reflective practitioners.

While the mentoring literature has grown, it has not matched the pace and vigor of the program development and implementation literature. It lacks in both consistent operationalization and rigorous quantitative methodology (Crisp & Cruz, 2009). Mentoring investigations frequently overly rely on the participants self-reporting the benefits of mentoring or, when outcome measures such as surveys are utilized, researchers fail to report the reliability and validity of survey items. Additionally, there is frequently the lack of a control group to evaluate program effects (Crisp & Cruz, 2009). Despite the lack of clear operational definitions, there are three consistent agreements about mentoring. The first is that mentoring is focused on the growth and development of another. The second is that several forms of support are used, including role modeling and psychological support, and finally, researchers agree that there is a degree of reciprocity associated with mentoring (Crisp & Cruz, 2009).

Mentoring activities vary and range from in-person meetings, telephone conversations, research opportunities, and support (Crisp & Cruz, 2009). A five-tier mentoring model is proposed for academic advisors to enhance student success in graduate education. Critical elements include: commitment to the mentoring process, establishing mentoring venues, serving as a role model, employing successful tools, and monitoring mentee's progress (Wright-Harp & Cole, 2008). Components of role modeling include mirroring an excellent professional image

and conveying a passion for the culture of the profession. Monitoring progress includes addressing coursework, professional development, and students' concerns and challenges (Wright-Harp & Cole, 2008). In STEM disciplines, mentors are described as "socializing or influence agents, encouraging protégés to internalize the norms, behaviors, and values of the scientific community" (Hernandez, Estrada, Woodcock, & Schultz, 2017, p. 462). Here the connection is made to navigational capital where minority students advance through social institutions not designed with persons of color in mind (Yosso, 2005). Mentorship might be particularly beneficial to helping minority students develop navigational capital. However, racial and ethnic minority students may have limited access to mentors (Lewis et al., 2016).

Mentoring is also thought to progress through stages. Kram (1983) proposes four stages of mentoring which span many years. The first stage of *initiation* lasts between six months and one year. *Cultivation* occurs between two and five years. *Separation* is the third stage of mentoring, where the mentee gains independence. The fourth and final stage is *redefinition,* where either the relationship ends or evolves into an entirely different relationship. While Kram (1983) proposes a mentoring relationship last more than five years, other mentoring relationships are as short as a handful of meetings.

There are a variety of sources of mentors, including faculty, peers, family, and friends. Mentorship models range from traditional 1:1 mentor-protégé models (Davis, 2007; Kendricks & Arment, 2011; Kendricks et al., 2013) to peer mentoring models, as well as networked approaches (Spivey-Mooring & Apprey, 2014). The role of the mentor is to provide knowledge and advice to the protégé, to support their psychosocial needs and to help the mentee to establish a professional identity, develop networks, and acculturate into the field. These tools are especially crucial to the success of racial and ethnic minority students, as socialization and

acculturation are critical to their success (Dorsey & Jackson, 1995). The traditional mentorship model, where a younger mentee is paired with an older, more experienced individual (such as a faculty member), is described first.

Traditional faculty: student mentor model. Traditional mentoring programs are commonly used to foster the retention of historically disadvantaged students in health sciences programs (Lewis et al., 2016; Wilson et al., 2010). A mentoring program to train the next generation of nurses in one program resulted in students of color feeling as if they had a support system that helped to build self-confidence. Additionally, participants reported an enhanced perception of the nursing profession and feeling as if they had improved academically because of the mentoring program. Faculty, who received cultural competence training and attended two mentor training workshops, reported role modeling the behaviors of a caring nurse for mentees, demonstrating caring for the students, and feeling as if the program had a positive impact on students' academic performance (Wilson et al., 2010). Consistent with critique from Crisp and Cruz (2009) about the methodological shortcomings of the mentorship literature, quantitative data to support the claim of improved academic performance is not provided by Wilson et al. (2010).

To improve mentoring support for underrepresented minorities on campus (including Hispanic, African American/Black, Alaskan Native/Native American, Native Hawaiian or Pacific Islander students, and junior faculty), Lewis et al. (2016) conducted a multicenter randomized control trial with mentor-protégé dyads. Participant were randomized into one of four groups: a mentor training group, a peer mentoring group for proteges, a combination group which included training for mentors and peers, and a control/usual practice group. Training included an introduction to self-determination theory (Deci & Ryan, 1985) and social capital theory with

recommendations for implementing these frameworks into mentoring sessions with protégés (Lewis et al., 2016). Self-determination theory, a study of human motivation, conceptualizes motivation as along a continuum (Deci & Ryan, 1985). Amotivation, or a lack of motivation, is on one end of the spectrum and the opposite end is intrinsic motivation, which is independent and self-determined. In this stage, actions are undertaken purely for the sake of interest and enjoyment (Deci & Ryan, 1985). Facilitating self-determined learners requires support for three necessities: autonomy, perceived competence, and relatedness (Ryan & Deci, 2000). Lewis et al. (2016) present self-determination theory as being relevant to positive mentoring outcomes as relatedness, autonomy, and competence can help meet the psychological needs of students from underrepresented groups. There was a short-term improvement in satisfaction with mentoring at the end of the two-month mentor training period, but this improvement was not sustained. While mentor training included knowledge about self-determination theory and skills, it is unclear whether mentoring needs specific to REM students and junior faculty were addressed (Lewis et al., 2016). Additionally, the researchers did not address racial congruence of the mentor-protégé dyads.

The role of race in mentoring. Effective mentoring warrants understanding of cultural differences and must be systematically planned and evaluated (Wright-Harp & Cole, 2008). In higher education, the R/CID model (Sue & Sue, 2012) may be useful when considering the mentoring students of racial/ethnic minority backgrounds and understanding the role that oppression may have played in the REM students' development. The concept of racially concordant mentoring has been explored in academic medicine (Yehia et al., 2014) and with Black students enrolled at predominantly a White institution (Guiffrida, 2005). African American and Hispanic medical residents report intentionally seeking out mentors of the same

race/ethnicity but having difficulty securing racially concordant mentor relationships (Yehia et al., 2014). Black faculty are perceived by students as a positive factor in African American success in higher education, providing extensive academic, career, and personal advising (Guiffrida, 2005). The unique needs of REM students warrant an understanding of the background of individuals who have been marginalized in higher education in the U.S. (Dodson, Montgomery, & Brown, 2009).

Minority students enrolled in a graduate program at a predominantly White institution (PWI) report that the lack of African American and Latina/o professors contributed to feelings of cultural and racial isolation. Additionally, participants cited difficulty forming productive relationships with White faculty and peers (Daniel, 2007). Conversely, relationships with Black faculty are perceived as more student-centered, comprising advocacy, academic coaching, and personal and professional support (Guiffrida, 2005). However, Guiffrida (2005) warns that facilitating productive relationships between faculty and students of color involves more than providing minority faculty role models. Instead, White faculty should focus on how they can understand the unique needs of minority students and establish strong supportive relationships (Guiffrida, 2005, p.703). The concept of *othermothering* is offered as a framework for understanding the unique mentoring needs of African American students enrolled in PWIs (Griffin, 2013; Guiffrida, 2005). Othermothering describes where Black slave children were raised by other mothers out of necessity and is used to emphasize the unique relationships between Black faculty and students due to shared experiences in the academy and motivation to improve the community (Griffin, 2013).

Faculty may benefit from developing their cross-cultural psychological capital to build psychological resources to succeed in cross-cultural interactions. Cross-cultural psychological

capital includes four dimensions: cross-cultural (a) self-efficacy, (b) hope, (c) optimism, and (d) resilience (Reichard, Dollwet, & Louw-Potgieter, 2014). Cross-cultural self-efficacy refers to one's belief in their ability to succeed in cross-cultural interactions. Cross-cultural hope facilitates the setting of realistic goals and then being able to devise alternatives when faced with barriers to achieving set goals. Cross-cultural optimism comprises expecting a positive outcome, allowing one to manage the ambiguity and uncertainty of challenging cross-cultural interactions. Finally, cross-cultural interactions are often unpredictable and may have negative or positive outcomes, and having cross-cultural resilience allows one to recover from setbacks and overcome stressful events.

A 20-item Cross-cultural Psychological Capital Scale was validated with a calculated Cronbach's alpha of 0.95 for all 20 items (Dollwet & Reichard, 2014). In a pretest, posttest single group quasi-experimental study, Reichard et al. (2014) conducted cross-cultural training for participants in the U.S. and South Africa to determine whether training could increase cross-cultural psychological capital. Researchers found a significant increase in psychological capital and cultural intelligence post-training. It is possible that faculty working with REM students may also benefit from cross-cultural training.

Consistent with the premise of the R/CID model (Sue & Sue, 2012), racial congruence of mentoring dyads matters more to some students than others. A sample of African American undergraduate STEM majors was surveyed during their senior year to determine mentorship preferences (Hernandez et al., 2017). Researchers drew participants from a population of 1,420 underrepresented minority students majoring in STEM disciplines in universities across the U.S. African American seniors who reported having a faculty mentor were selected (n=253). Seniors were targeted to establish the effects of high-quality mentorship on students' decisions to pursue

advanced training in STEM. The quality of mentorship was operationalized according to four criteria: psychosocial support and instrumental support, mentor guided opportunities for co-authoring experiences, and proteges' perceptions of relationship satisfaction. Researchers used a 15-item measure and found that perceived similarity and not demographic similarity (race or gender) served as the dominant dimension influencing the quality of mentoring (Hernandez et al., 2017). This finding emphasizes the importance of perceived similarity in the formation of a social connection, highlighted by Walton et al. (2012).

To increase the social and academic involvement of Black students in STEM programs at a historically Black college and university (HBCU), a Scholars Program was developed based on the K-12 model of culturally relevant practices (Kendricks & Arment, 2011). Program components included (a) a supportive family environment, (b) an academic learning community where students are required to take at least two STEM courses with their fellow scholars, and (c) residing in a living-learning community with shared learning space. Five learning community coordinators, described as caring teachers who set high expectations for students and used dynamic classroom strategies and discipline, provided mentorship. Participants were also required to attend one-hour mentoring meetings where mentors tracked student performance and provided advice and study tips. Scholars also attended two professional development workshops and two graduate school visits. Results of the program included a 71% involvement in STEM research and 100% of students meeting all the program requirements. Students ranked participating in research as having the largest impact on their preparedness for a career in STEM but also valued the connection with faculty and other students in the program (Kendricks & Arment, 2011).

While intrapersonal variables such as self-efficacy (Bandura, 1986) and setting realistic goals and intentions are important to minority student success in college, personal attributes are less important than peer relationships (Zea, Reisen, Beil, & Caplan, 1997). Quality relationships with fellow students can also foster social integration and contribute to academic persistence and success (Fullick, Smith-Jentsch, Yarbrough & Scielzo, 2012; Tinto, 1993; Walton et al., 2012; Yomtov, Plunkett, Efrat, & Marin, 2017). The role of peers in contributing to minority student success is explored in another popular mentoring model: peer mentorship.

Peer mentoring models. While the traditional mentoring model includes a hierarchical relationship, in the peer mentoring model, the novice/protégé is paired with a more advanced peer (Dodson et al., 2009; Terrion & Leonard, 2007). Vygotsky (1978) introduced the zone of proximal development as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers" (p. 86). Notable here is that Vygotsky (1978) viewed interactions with peers as an effective way to develop skills and strategies necessary for academic success.

Minority students who are matched with minority upper-level students who have been successful, showed enhanced self-efficacy as, through mentorship, mentees have access to role models who have demonstrated coping and persistence (Gloria et al., 1999). Bandura (1986) highlights the importance of role modeling for the development of complex skills and emphasizes that the time to master new behaviors can be abbreviated through observing role models. By observing role models, protégés learn to navigate novel situations rather than relying on trial and error (Bandura, 1986), again highlighting how mentoring can help REM students build navigational capital.

The peer mentoring dyad is roughly equal in terms of age, experience, and power. Like traditional mentors, peer mentors serve two main functions: career-related and psychosocial. An important difference is that in the career-related domain, there is more information sharing and strategizing as opposed to the coaching and exposure that occurs in the traditional mentoring relationship. The psychosocial aspect is more like the traditional mentoring relationship. In this domain there is emotional support, feedback, and friendship (Terrion & Leonard, 2007).

As described, the hallmark of the peer mentoring relationship, compared with tutoring, for example, is that peer mentoring relies on an emotionally supportive relationship between mentor and mentee, which can increase connectedness to the university (Yomtov et al., 2017). First-year university students (n=162) in a peer mentored relationship reported significantly more integration into the university and a stronger connection to the university than non-mentored peers (n=142). Peer mentors (required to have a cumulative GPA of 3.0 and strong interpersonal skills) received mentoring training and were responsible for modeling effective in-class behavior for mentees. Dyads, matched based on enrolled discipline or major, completed three mentoring activities over a semester (Yomtov et al., 2017). While the average age of students in this study was 18 years (limiting applicability to a population of graduate students), 90% of the study sample belonged to a racial/ethnic minority group. Limitations include the lack of information about the instrument validity of the survey used. Ultimately, however, this quasi-experimental study with a large study sample highlights that university connectedness can change after a semester-long intervention for first-year university students.

While the benefits of peer mentorship are established in the literature (Spivey-Mooring & Apprey, 2014; Yomtov et al., 2017), Terrion and Leonard (2007) critique that little attention is paid to who might be best suited to fulfilling the function of a peer mentor. A literature review

identified 10 peer mentor characteristics based on the function performed as well as five general characteristics needed to fulfill the peer mentor role. Peer mentor pre-requisites included the ability and willingness to commit time (especially important in university mentoring programs where students struggle managing competing priorities). Effective mentors should be able to describe how mentoring will fit into their schedules. However, the authors also highlight that satisfaction with mentoring does not increase as time increases, and few authors specify the ideal amount of time to dedicate to mentoring. Additional mentoring pre-requisites included prior mentoring experience, academic achievement (which contributes to mentor credibility), and university experience. Peer mentors must have some experience with navigating the university environment. Finally, the authors caution there is conflicting evidence regarding mentor gender and race, and further study is warranted (Terrion & Leonard, 2007). Characteristics related to serving the career-related function included a shared program of study and self-enhancement motivation, related to personal learning and gratification. Fulfilling a psychosocial function requires effective communication skills, supportiveness, trustworthiness, empathy, personality match, enthusiasm, flexibility, and an interdependent attitude to mentoring, mentee, and program staff. This last characteristic involves a willingness to engage in the learning experience with the mentee and develop personally and professionally (Terrion & Leonard, 2007). Mentor development is explored next.

Mentoring the mentor. Another critique of mentoring interventions is that mentors receive little training. To serve as peer mentors to first-year university students, peer mentors completed an extensive training program based on three pillars of successful mentoring (Yomtov et al., 2017). Organizing principles included: (a) knowledge of mentoring on the run, (b) creating a community of mentors, and (c) facilitating a culture of mentoring. *Mentoring on the run*

describes a shift from thinking about mentoring as a formal interaction to infusing mentoring into daily interactions with students. Peer mentors are educated that every interaction is potentially a mentoring interaction (Omatsu, 2002). Peer mentors completed an eight-week online training that comprised readings and online discussions on the conceptual aspects of mentoring. Topics for online modules included diversity and inclusion training, mentorship practice, and campus emersion. Before the start of the semester, mentors attended an in-person campus training, which included workshops to empower mentors. Finally, throughout the semester, peer mentors received both formal and informal check-ins from researchers (A. Garcia Marin, personal communication, May 31, 2019). Notably, at the end of the study period, mentees recommended that there be increased collaboration between peer mentors and faculty (Yomtov et al., 2017). Peer mentor-faculty interaction, a hallmark of networked mentoring, is discussed next.

Networking mentoring models. In the networking mentoring model (Haring, 1999), each person in the network contributes to each other's success, alternating roles with advancing professionally (Dodson et al., 2009). The Cole and Wright-Harp multiple mentor model acknowledges that students need mentors of differing ages, with varied skills and traits, who can meet their varied needs (Wright-Harp & Cole, 2008). The authors propose that graduate students need five types of mentors: academic, clinical, research, peer, and career/professional development mentors. This assertion is reinforced by Terry and Ghosh (2015), who emphasize that doctoral students need academic, personal, and professional supports to be successful, highlighting the need for different types of social support and multiple mentors. While Terry and Gosh (2015) focused on EdD students, who have difficulty establishing development and social networks, parallels can be drawn to REM DPT students who also have complex life roles and would benefit from multiple mentors. While Wright-Harp and Cole (2008) and Terry and Gosh

(2015) highlight the value of multiple mentors, the researchers do not elaborate on the interaction between mentors. A unique mentoring program at the University of Virginia that leverages mentor interactions is discussed next.

To promote an inclusive environment, first-year graduate students from diverse backgrounds at the University of Virginia were matched with a faculty mentor and a peer mentor. The peer mentor also served as a mentoring coach to the faculty member, providing insight into the unique needs of the graduate student (Spivey-Mooring & Apprey, 2014). The mentoring triad met regularly and attended professional development workshops and panel discussions. Students met not only with their mentors but also with other members of their cohort once a month, highlighting the benefit of the networked model. Students reported that faculty and peer mentoring positively contributed to their adjustment to graduate school and their overall academic success. Many students reporting wanting to quit during the first year due to academic stress and social isolation but shared that the mentoring institute provided the support they needed to persist. Social programs helped students learn how to network professionally in a social setting. Despite the positive findings of the mentoring institute, many students (43.8%) reported still feeling racially isolated at the institution and socially alienated (43.7%). Some faculty members valued the mentoring coach, and others felt that they did not need a coach due to a positive relationship with their mentee (Spivey-Mooring & Apprey, 2014).

It is evident that high quality mentoring is vital to support REM in careers in healthcare and academia (Dodson et al., 2009; Griffin et al., 2010; Spivey-Mooring & Apprey, 2014).). However, few mentors receive training on how best to meet the unique mentoring needs of REM students who have additional challenges to overcome, such as discrimination, decreased confidence, and social isolation (Lewis et al., 2016). For these reasons, the proposed intervention

focuses on addressing the unique mentoring needs of REM DPT students through a networked mentoring model aligned with the racial/cultural identity development model (Sue & Sue, 2012).

Proposed Intervention: A Networked Mentoring Model

The proposed intervention would match first-year REM DPT students with a faculty mentor and a peer mentor (a second-year REM DPT student at the institution under study). Given the demographics of the DPT faculty, it was anticipated that the majority of participating faculty would be White. The peer mentor served as additional support to the REM student and as a mentoring coach to faculty, offering insight into the experience of a REM student at a predominantly White institution. Students in the first year of the DPT program participated in a two semester-long mentoring and professional development program. Mentoring support to REM students included opportunities for professional development, informal social gatherings, and networking opportunities with minority leaders in the health sciences field.

In the needs assessment, which guided this intervention, REM DPT students defined success as giving back to the community and expressed wanting to return to their home states to effect change. However, students identified the shortage of minority faculty both within the academic institution and clinical facilities as a barrier to their success. The call for minority mentors is consistent with the resistance and immersion phase of the R/CID (Sue & Sue, 2012). Networking opportunities would provide exposure to minority leaders and role models.

The College Experience Questionnaire (Spivey-Mooring & Apprey, 2014), designed to assess graduate students' sense of belonging and connectedness, was administered pre and post-intervention to evaluate program effectiveness. REM graduate students who participated in a mentoring institute at the University of Virginia reported that the program contributed to their academic success and feeling of connectedness to the academic community (Spivey-Mooring &

Apprey, 2014). A program modeled after the University of Virginia mentoring institute could potentially address barriers to student success in the academically rigorous program under study.

Conclusion

This review explored the research related to supporting culturally and linguistically diverse learners in an academically rigorous Doctor of Physical Therapy program. The literature review explored primary drivers to improve academic performance among REM DPT students. Interventions presented related to language and dialects, scaffolding the didactic program, developing a culturally responsive DPT curriculum, and mitigating stereotype threat through faculty, staff, and student training. Ultimately, secondary drivers formed the focus of the literature review as the key levers for productive change. The second part of the literature review focused on the link between social belonging and academic achievement and promoting social and academic integration through mentorship. Finally, a networked mentorship model was proposed.

Chapter 4: Intervention Procedure and Program Evaluation Methodology

The theory of university departure (Tinto, 1993) highlights academic and social integration as vital to the retention of students in higher education. Students of color report that interacting with faculty mentors of color helps introduce them to the unwritten norms and rules of the profession, role-models effective professional behavior, and improves their social capital by introducing them to a significantly different network (Davis, 2007). Quality relationships with fellow students can also foster social integration and contribute to academic persistence and success (Fullick et al., 2012; Tinto, 1993; Walton et al., 2012; Yomtov et al., 2017). As increasing student, peer, and faculty contact is vital to increasing social and academic integration of minority students in higher education (Tinto, 1993), the intervention comprised a networked mentoring program for first-year REM DPT students, aligned with the racial and cultural identity development model (Sue & Sue, 2012).

Purpose of the Study

The treatment theory (Leviton & Lipsey, 2007) in this intervention study targeted the change mechanism by which REM DPT students, provided with racially concordant mentorship from peers, demonstrate decreased social isolation and improved academic performance (Walton & Cohen, 2011). The specific treatment process was framed within the racial and cultural identity development (R/CID) model, which proposes that REM individuals are on a developmental continuum as they work to understand themselves and their culture in relation to the dominant culture (Sue & Sue, 2012). A model that included a White faculty mentor and REM peer would provide REM DPT students with the sought-after mentor regardless of where they fall in the R/CID continuum. The specific treatment process (Leviton & Lipsey, 2007) is detailed using a causal diagram (see Figure 4.1).

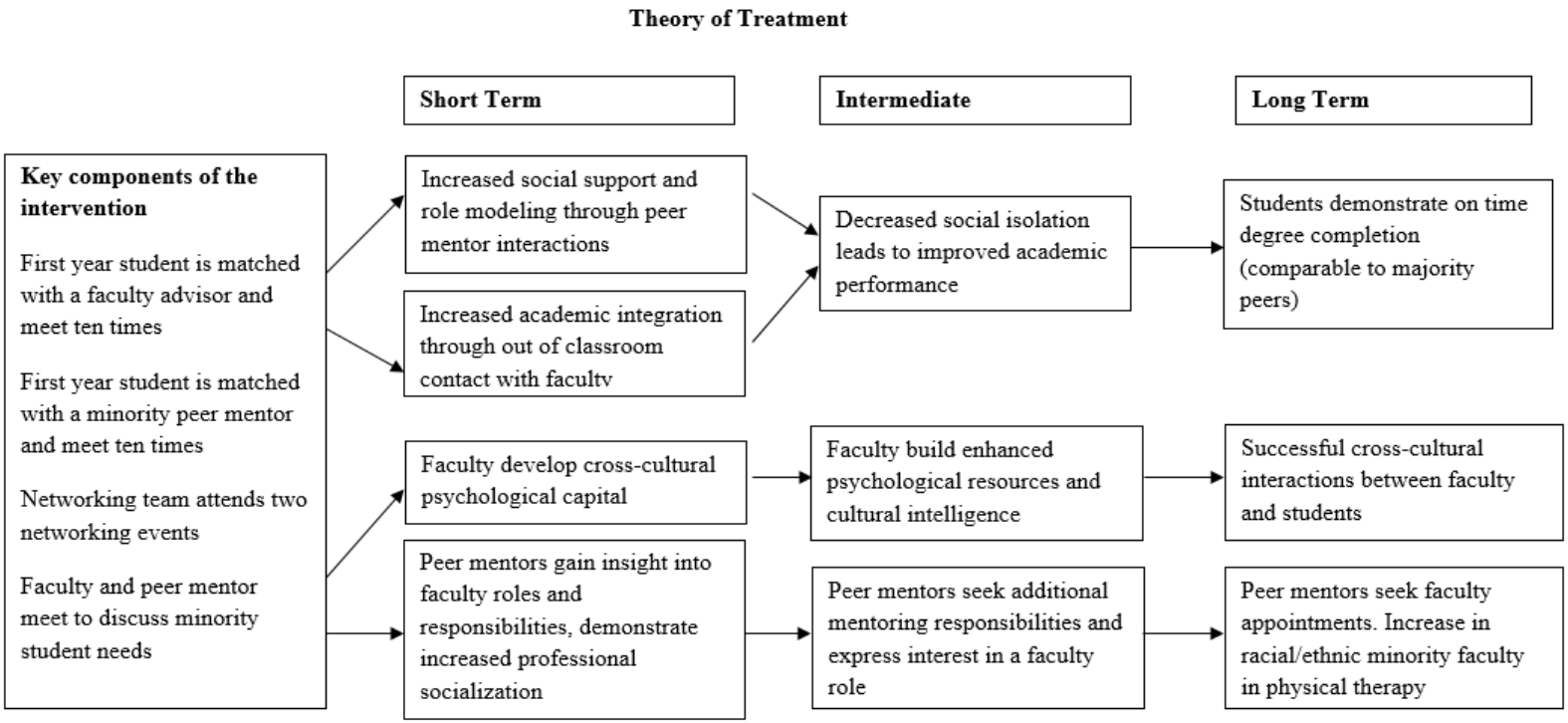

Figure 4.1 Theory of treatment for facilitating on-time degree completion for racial and ethnic minority Doctor of Physical Therapy students.

In addition to a treatment process for first-year DPT students who participated as mentees, it was also anticipated that REM peer mentors, through interaction with faculty advisors, would gain insight into the roles and responsibilities of faculty (a short-term outcome). In the intermediate-term, peer mentors may seek out additional mentoring opportunities and express interest in a faculty role, ultimately seeking out academic appointments and addressing the problem of practice (the underrepresentation of racial and ethnic minority faculty in physical therapy higher education) in the long term.

Research Questions

The following research questions in this study addressed both process and outcome evaluation:

RQ1: How has the study implementation adhered to or differed from the proposed implementation procedures?

RQ2: To what extent does a networked mentoring model mitigate social isolation for first-year REM DPT students?

RQ3: To what extent does a networked mentoring model foster sense of belonging for first-year REM DPT students?

RQ4: How does participation in a networked mentoring model contribute to DPT faculty's cross-cultural psychological capital?

RQ5: How do REM DPT peer mentors guide faculty to meet the unique mentoring needs of first-year REM DPT students?

RQ6: How does participation in a networked mentoring program contribute to second-year REM DPT students' socialization into the physical therapy profession?

Research Design

This study used a quasi-experimental mixed methods (explanatory sequential) design (Leech & Onweugbuzie, 2009; Shadish, Cook, & Campbell, 2002) with a treatment group and a comparison group to investigate whether a networked mentoring model could mitigate social isolation and improve academic performance in REM DPT students. First-year REM DPT students self-selected into a treatment group (networked mentoring model group), and all DPT students were recruited into a comparison (usual care) group. The comparison group participated in a buddy system implemented by the institution under study where students are matched with a second-year peer, without structure to the matching process or guidance for peer interactions. Race is not considered when matching first-year students and buddies. While first-year students in the comparison group interacted with both their faculty advisor and peer mentors (separately), the buddies did not communicate with faculty advisors about mentees. Additionally, the student who consented into the comparison group was not invited to attend networking events, limiting the effect of networked mentoring.

Per the three-dimensional typology of mixed methods designs (Leech & Onwuegbuzie, 2009), this study used a partially mixed, sequential, equal status design approach as both the quantitative and qualitative facets were equally weighted. This study leveraged a mixed methods approach in the following components: (a) the research objectives included both prediction and exploration, (b) the type of data collected was both quantitative (through use of the College Experience Questionnaire and the Cross-Cultural Psychological Capital Survey) and qualitative (using open-ended survey questions and focus group interviews), and (c) analysis included both statistical analysis of survey data and thematic analysis of interview data and survey responses.

The purpose of methodological triangulation in this study was to provide confirmation and explore contradictions that may have emerged from multiple sources of information common in the evaluation of social programs. Leech and Onwuegbuzie (2009) highlight the four main reasons for mixed methods research: (a) optimizing the sample, (b) instrument fidelity, (c) treatment fidelity, and (d) maximizing the interpretation of data. In this study, the researcher selected a mixed methods approach to enhance the interpretation of data. Ultimately, data triangulation using surveys and focus group interviews helped determine whether the outcomes were attributable to the intervention and not external factors (Johnson, Onwuegbuzie, & Turner, 2007; Leviton & Lipsey, 2007).

As this study focused on a marginalized population in higher education (REM enrolled in a predominantly White institution), the mixed methods design, particularly qualitative measures (focus group interviews with participants and peer mentors), aided in capturing participant's voice and lived experience (Mertens, 2018). Qualitative measures and questions for participants such as "What are the downsides of a mentoring relationship?" and for peer mentors such as "What are the costs of mentoring?" were leveraged to detect unintended, potentially negative consequences of the intervention. Paying attention to the subjective experience of participants also helped to decrease the power imbalance between the researcher (a faculty member at the institution under study) and participants, students in the DPT program (Bamberger, Tarsilla, & Hesse-Biber, 2016; Mertens, 2018). The logic model highlights additional program details.

Integrative Theory of Treatment and Logic Model

Logic models are more than conceptual maps but instead serve as integrative frameworks to help highlight assumptions about activities and resources needed to realize program outcomes

(Cooksy, Gill, & Kelly, 2001). The logic model (Figure 4.2) specifies the input, outputs, and outcomes in this study.

Inputs. This study leveraged human resources as a key input. The primary stakeholders and specific target population were REM students enrolled in their first year of a DPT program. Participants received mentoring from faculty advisors, and second-year REM DPT peer mentors and attended two networking events.

Activities. Participant activities included faculty mentoring sessions, peer mentoring sessions, as well as two networking events with faculty and peer mentors. Faculty stakeholders had agreed that biweekly mentoring meetings were realistic, given the modular curricular design at the institution under study. Each course in the DPT curriculum is an intensive four-week module. Biweekly meetings would have facilitated mid- and post-course meetings between participants and faculty advisors. Also, faculty and peer mentors met twice to discuss mentee progress and to allow for peer mentors to advocate for REM student needs.

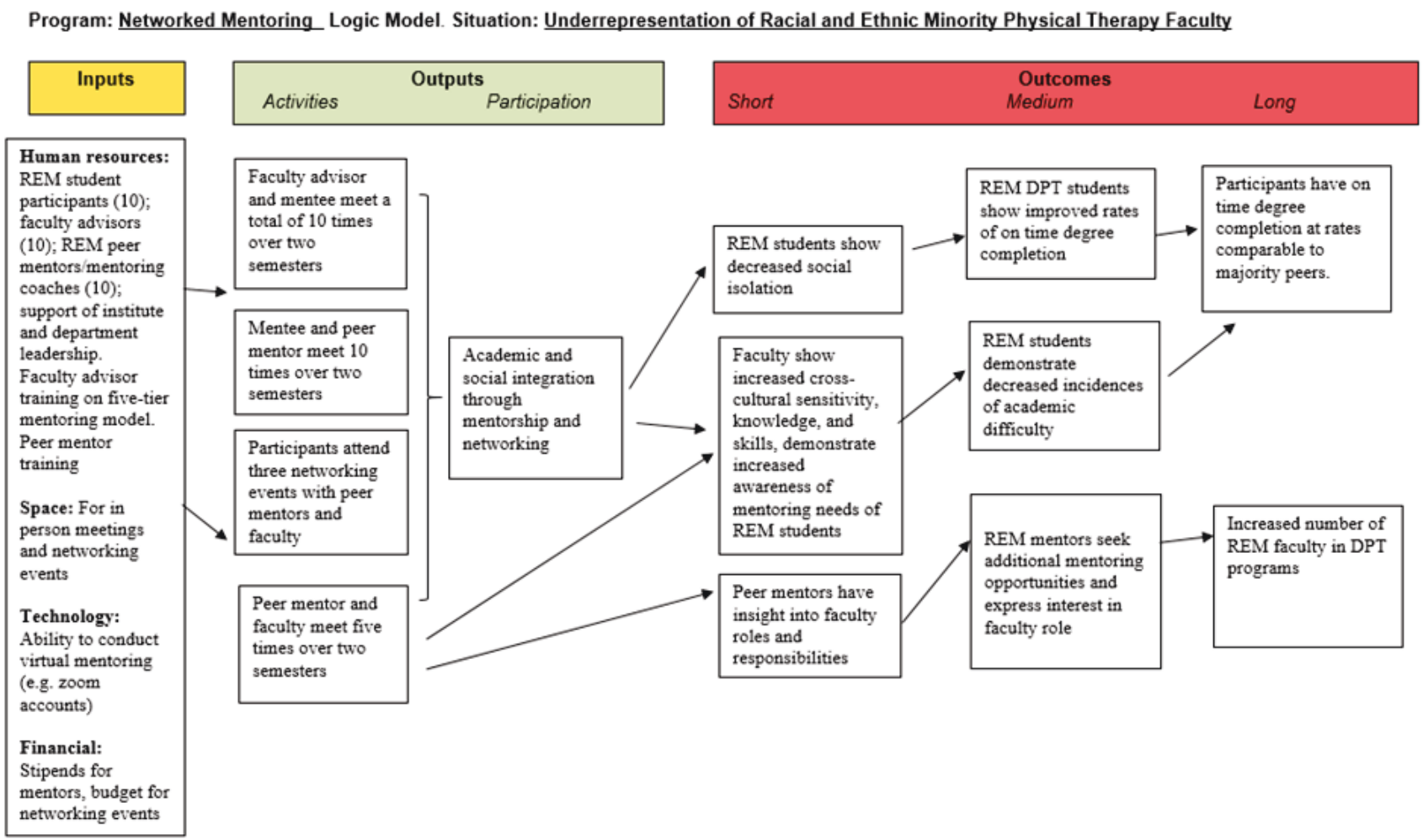

Figure 4.2. Logic model of the networked mentoring program highlighting inputs, outputs, and outcomes.

Outcomes. Minority graduate students who participated in networked mentoring programs reported that the program contributed to their academic success (Spivey-Mooring & Apprey, 2014; Wilson et al., 2010) and feeling of connectedness to the academic community (Spivey-Mooring & Apprey, 2014). Anticipated student short-term outcomes in this program included decreased social isolation (measured by the College Experience Questionnaire and focus group interviews). Expected intermediate student outcomes include decreased incidences of academic difficulty, and the hypothesized long-term outcome is on-time degree completion (see Figure 4.1).

Faculty who participated in a mentoring program to enhance the diversity of the nursing profession reported that they were able to role model the behaviors of a caring nurse and have a positive impact on students' academic performance (Wilson et al., 2010). Anticipated short-term faculty outcomes in this study included increased cross-cultural psychological capital (measured by the Cross-Cultural Psychological Capital Survey and focus group interviews). Intermediate outcomes include enhanced psychological resources and cultural intelligence, and long-term outcomes include successful cross-cultural interactions between faculty and students.

Potential short-term outcomes for the peer mentors included an increased knowledge of faculty roles and responsibilities and increased socialization into the physical therapy profession. Hypothesized intermediate outcomes include peer mentors seeking out additional mentoring opportunities and an increased interest in academia. The ideal long-term outcome includes peer mentors seeking out faculty appointments, resulting in an increased number of REM faculty in physical therapy. In addition to inputs, output, and outcomes, the logic model highlighted the process evaluation of the networked mentoring model, described next.

Fidelity of Implementation of Networked Mentoring

Fidelity of implementation can be measured by evaluating program adherence, dose of the intervention delivered, quality of the intervention, participant responsiveness, and program differentiation (Dane & Schneider, 1998). This process evaluation focused on three elements to evaluate program integrity: project implementation (whether the intervention was delivered as intended), fidelity of implementation (dosage of mentorship received by participants), and context. Project implementation is discussed first.

Project implementation. Describing acceptable delivery of the intervention is a vital first step in assessing fidelity of implementation (Saunders, Evans, & Joshi, 2005). Mentoring teams, formed within the physical therapy program, consisted of a faculty mentor and peer mentor to support the first-year REM DPT student. A five-tier mentoring model has been proposed for academic advisors to enhance success in graduate education. Critical elements include: commitment to the mentoring process, establishing mentoring venues, serving as a role model, employing successful tools, and monitoring mentee's progress (Wright-Harp & Cole, 2008). A participant survey captured the number of critical elements completed during a mentoring session, with priority given to whether faculty served as role models and monitored participant progress. Per Wright-Harp and Cole (2008), components of role modeling include mirroring an excellent professional image and conveying a passion for the profession. Monitoring progress includes addressing coursework, professional development, and participants' concerns and challenges (Wright-Harp & Cole, 2008).

Fidelity of implementation – dose. It is vital to provide specific information with regards to the dosing of the intervention, specifically the minimal intervention needed to deliver treatment at the effective strength (Leviton & Lipsey, 2007). Mentoring programs vary in their

dosing, with some mentors meeting with proteges once a week (Wilson et al., 2010) and others meeting less frequently (Kendricks & Arment, 2011; Wright-Harp & Cole, 2008). Faculty stakeholders agreed that biweekly mentoring meetings were realistic, given the modular DPT program curricular design. The *ideal* dose of mentoring in this study was operationalized as a total of 10 biweekly faculty mentoring sessions and 10 peer mentoring sessions. The operationalized *acceptable* dose of mentoring included a total of five faculty mentoring sessions and five peer mentoring sessions. Five mentoring meetings over the two-semester long intervention entailed monthly touchpoints and ensured that first-year students and faculty and peer mentors met at least once during each four-week DPT course. The researcher posted calendar reminders for faculty mentoring sessions and sent out calendar invites to first-year REM DPT student participants, peer mentors, and faculty to attend networking events.

Contextual factors. Important contextual factors included the characteristics of the organization as well as the mentors delivering the program (Saunders et al., 2005). The institution under study is an independent, interprofessional graduate school of health sciences that adopted a new strategic plan for 2018-2022. One of the strategic priorities is to “Build and nurture a diverse and inclusive Institute community" with a strategic initiative to "Strive to promote an inclusive community with the values of social justice and equity – language, awareness, consistent message from leadership" (MGH Institute of Health Professions Strategic Plan, 2018). This initiative aligns with the problem of practice and potential intervention.

The researcher anticipated challenges with implementation at the department level. DPT Program faculty have been under intense pressure developing and implementing a new curriculum over the last six years and were in the process of curriculum evaluation. For these reasons, the focus of process evaluation at the contextual level focused on the institutional

barriers and facilitators, which affected the delivery of mentoring sessions to the participants. Ultimately, the researcher could not have anticipated the most important contextual factor, the coronavirus 2019 (COVID-19) pandemic. The effects of the COVID-19 outbreak are discussed further in the next chapter.

Participant responsiveness. First-year participants in the intervention and comparison groups completed electronic surveys with both close- and open-ended questions at the midpoint and end of the study period (see Appendix G and Appendix H). Peer mentors also completed mid and end study point surveys (see Appendix I). Open-ended responses were analyzed thematically and iteratively utilizing the six-step process for thematic analysis identified by Braun and Clarke (2006). Iterative data analysis at touch points during the study allowed for changes to the intervention to be implemented promptly (a hallmark of improvement science; Lewis, 2015).

Improvement science relies on learning from variation, and about learning more about the specific processes under which innovation succeeds or fails (Christie, Inkelas, & Lemire 2017). In this manner, the improvement science lens is a good match for process evaluation. However, there are also clear connections between the improvement science framework and outcomes evaluation. The outcomes evaluation is described next.

Outcome Evaluation

This study used multiple molecular components (faculty and peer mentoring and networking events) to achieve a short-term outcome for first-year REM DPT students (mitigating social isolation). Positive outcomes could have been attributed to select components of the networked mentoring model (Levin, 2013; Shadish et al., 2002). The mixed methods approach (particularly qualitative means) helped to determine which of the molecular components was perceived to be most beneficial to participants.

The outcome evaluation focused on whether the networked mentoring model could mitigate social isolation and promote a sense of belonging in first-year REM DPT students. The causal diagram detailed the treatment process linking critical intervention components with short term outcomes (academic and social integration for REM DPT students; see Figure 4.1). The College Experience Questionnaire (CEQ; Appendix J) was administered pre and post-intervention to evaluate program effectiveness (Spivey-Mooring & Apprey, 2014). Intermediate outcomes (decreased social isolation and decreased academic difficulty) were posited to lead to on-time degree completion for participants.

Additionally, the causal diagram highlighted the potential changes to the knowledge and skills of peer mentors in this study. Projected short term outcomes for peer mentors included an increased awareness of faculty roles and responsibilities and socialization into the physical therapy profession. This increased knowledge and awareness may lead peer mentors to seek additional mentoring opportunities and ultimately seek faculty appointments leading to a long-term outcome of an increased number of REM physical therapy faculty. Focus group interviews with peer mentors explored changes in knowledge, skill, and motivation to pursue careers in academia.

A short-term outcome for faculty included changes to cross-cultural psychological capital. Faculty in the treatment and comparison groups completed the Cross-Cultural Psychological Capital scale (Dollwet & Reichard, 2014; see Appendix K) at the beginning and end of the study period. As there are multiple sources of data to allow for triangulation, a data accounting log helped to monitor which types of data were collected from each participant (see Appendix L). Table 4.1 outlines the study timeline.

Table 4.1

Study Timeline

Task	Sep	Oct	Nov	Dec	Jan	Feb	March	April
Participant recruitment	x							
Faculty training	x							
Peer mentor training	x							
Administer CEQ	x							x
Administer PsyCap	x							x
Mentoring sessions		x	x		x	x	x	x
Networking events			x		x			
Peer mentor PLC in-person meeting			x					
Faculty mentor PLC in-person meeting				x				
Participant surveys				x			x	
Peer mentor survey				x			x	
Focus group interviews								x

Method

This study hoped to enroll 10 first-year REM DPT students and 10 second-year REM DPT peer mentors. Due to the small sample of REM students, the researcher employed non-probability purposeful sampling (Lochmiller & Lester, 2017). The researcher also hoped to enroll 10 faculty mentors in the treatment group and 10 DPT faculty in the comparison group.

Participants

Seventy first-year students admitted to the Doctor of Physical Therapy program in 2019 included 49 females (70%) and 21 male students (see Table 4.2). The increased representation of female students is consistent with the demographic profile of the physical therapy profession, which in 2013 was 70% female (APTA Workforce Data, 2016). Students self-reported as White (47.1%), Asian/Pacific Islander (21.4%), Hispanic (12.9%), African American/Black (4%), or Alaskan Native/Native American (1.4%) upon application to the program. Five students self-

identified as biracial, and four students did not report race on their application to the program. When compared with aggregated data on physical therapy programs in the U.S. (CAPTE, 2019), the study population is more racially and ethnically diverse, with the potential to impact the generalizability of results.

Table 4.2

Demographics of Participants and Peer Mentor Groups Compared with Programs Nationwide

Demographic Data	First-year DPT students (participants)	Second-year DPT students (peer mentors)	Accredited programs nationwide between 2018-2019
Total number of students	70	69	34,218
Gender			
Female	49 (70.0%)	46 (66.7%)	21,131 (61.8%)
Male	21	23	13,074
Ethnicity			
African American/Black	3 (4%)	6 (8.7%)	3.4%
Asian/Pacific Islander	15 (21.4%)	15 (21.7%)	9.2%
Hispanic	9 (12.9%)	10 (14.5%)	6.5%
Native American/Alaskan Native	1 (1.4%)	1 (1.5%)	0.4%
White	33 (47.1%)	31 (44.9%)	74.6%
Mixed race	5 (7.1%)	1 (1.5%)	--
Unknown	4 (5.7%)	5 (7.2%)	3.0%

Note: The data reflects accredited and developing physical therapist education programs in the United States for the academic year 2018–19 (CAPTE, 2019). CAPTE bears no responsibility for interpretations presented or conclusions reached based on the analysis of this data.
Option added as of 2017 Annual Accreditation Report for Student Gender 'Other/Choose Not To Answer' explaining the missing CAPTE gender data.

The class of second-year DPT students included 46 female and 23 male students (see Table 4.2) Students self-reported as White (44.9%), Asian (21.7%), Hispanic (14.5%), African American/Black (8.7%), or Alaskan Native/Native American (1.5%) upon application to the program. The study population of peer mentors included 34 second-year students who self-identified as belonging to a racial/ethnic minority upon application to the program.

Faculty in the physical therapy department in 2019 included 22 core faculty members, 18 females (81.8%), and four males. Faculty self-identified as White (86.4%) or Asian (13.6%). The number of White faculty is consistent with the demographics of core faculty teaching in accredited physical therapy programs in the U.S. (see Table 4.3). While the percentage of Asian faculty members is higher than the national average, this number is not proportionate to the number of Asian students (see Table 4.2). It highlights the shortage of racially concordant mentors in the department.

Table 4.3

Demographic Data of Faculty Compared with Faculty Nationally

Demographic Data	Core faculty	Number of core faculty nationally in 2018
Total number	22	2730
Ethnicity		
African American/Black	--	73 (2.7%)
Asian	3 (13.6%)	162 (5.9%)
Hispanic	--	90 (3.3%)
Native American/Alaskan Native	--	5 (0.2%)
Native Hawaiian/Pacific Islander	--	4 (0.1%)
White	19 (86.4%)	2350 (86.1%)
Mixed race	--	29 (1.1%)
Unknown	--	13 (0.5%)

Note: Faculty demographic data from accredited programs available from CAPTE (2019).

Instrumentation

College Experience Questionnaire (CEQ). A sample of students of color were involved in the development of the CEQ, a 21-item questionnaire, designed to assess graduate student sense of belonging and connectedness (Spivey-Mooring & Apprey, 2014). The CEQ includes three subscales: university environment, university connectedness, and university alienation. With a four item Likert scale, scores range from 21-84. Sample questions included "I feel socially alienated at this institution" (university alienation), "I believe that there are enough

resources on campus to help deal with any racial or cultural issue a student may have" (university environment) and "I represent the kind of student the institution is proud to have as part of its student body" (university connectedness). Exploratory factor analysis yielded an overall alpha reliability coefficient of 0.78. The scale has previously been administered to graduate students of color as a paper and pencil test (Spivey-Mooring & Apprey, 2014). In this study, the CEQ was administered electronically with a five-item Likert scale.

Cross-Cultural Psychological Capital Survey (Cross-cultural PsyCap). The cross-cultural PsyCap scale (Cross-Cultural PsyCap; Dollwet & Reichard, 2014) is adapted from the PsyCap survey, designed to measure positive psychological capital and four psychological resources: efficacy, hope, optimism, and reliance (Reichard et al., 2016). The scale is a 20-item, five-point Likert scale measure including four subscales: cross-cultural hope, cross-cultural self-efficacy, cross-cultural optimism, and cross-cultural resilience, to measure the development of cross-cultural skills. The Cronbach's α for each of the four sub-scales is 0.80 (hope), 0.91 (self-efficacy, 0.82 (optimism), and 0.92 (resilience). Sample questions include "I feel confident when interacting with individuals from different cultures" and "I feel confident in analyzing cross-cultural problems to find a solution" (Dollwet & Reichard, 2014). The Cross-Cultural PsyCap was administered to faculty electronically at the beginning and the end of the study period.

Perceived competence in peer mentoring. The personality evaluation inventory (Shrauger & Schohn, 1995) is used to assess perceived competence in one's abilities, particularly the skills required by students in higher education (Stankov, Kleitman, & Jackson, 2015). The personality evaluation inventory includes 54 items grouped into eight subscales, including a social domain, measured on a four-point Likert scale ranging from 1 (*strongly agree*) to 4 (*strongly disagree*). The Cronbach alpha coefficient for the scale ranges from 0.71-0.90 (Stankov

et al., 2015). The researcher modified a single item from the personality evaluation inventory to measure changes in peer mentor confidence in their peer mentoring abilities pre and post mentor training. The item is: "I feel confident in my ability to serve as a peer mentor." Second-year DPT peer mentors completed this item electronically before and after completing the online training modules, as well as at the mid- and end-study points.

Focus group interviews with participants. A review of the literature highlighted the value of qualitative research methods in understanding the unique perspective of minority students (Odom et al., 2007). Focus group interviews explored REM participants' perceptions of a networked mentoring model. Focus groups, as opposed to individual interviews, allowed the outcome evaluation to harness the shared minority experience and to increase subject empowerment to speak up in the presence of peers. The first-year REM DPT student/mentee interview protocol (see Appendix N) has been adapted from Spivey-Mooring and Apprey (2014). Sample questions included 'What has your experience at this institution been like?" "Do you feel connected or alienated within the institute community?" "What is the greatest strength of this program?", and "What has been your most positive experience in the mentorship program?"

Focus group interviews with peer mentors. Peer mentors also participated in focus group interviews at the end of the study period. The peer mentor interview protocol (see Appendix N) has been adapted from Spivey-Mooring and Apprey (2014). Sample questions included, "Can you describe your role as a peer mentor?" and "How does the mentoring program facilitate first-year minority DPT students' successful transition into graduate school?" Additionally, peer mentor interviews explored second-year DPT students' professionalization into the physical therapy profession. Socialization is operationalized as the process by which individuals gain the knowledge, skills, and values necessary for successful entry into a

professional career (Ramirez, 2017). Sample questions included, “How has your involvement in this program influenced your socialization into the physical therapy profession?”

Focus group interviews with faculty. The researcher conducted focus group interviews with faculty using an interview protocol (see Appendix O) adapted from Chan et al. (2015). Sample questions included “What is the role of race/ethnicity in your mentoring?” and “Can you describe when your race/ethnicity is different from your mentee, how do you deal with it?” “What are the most effective or important mentoring techniques or activities you use, and why? Tell me about a time these techniques worked well. A time when they did not?” and “Was there a change in your cross-cultural self-efficacy as a result of this program?”

Procedure

Many educational reforms are hypothesized to fail because they do not consider the complexity of the system and the interventions that are already in place (Bryk et al., 2015). External factors considered in this context included current interventions that target the study population, such as small-group tutoring for students at risk of academic difficulty and access to an academic support counselor. Also, a buddy system pairs first-year DPT students with second-year students based on interests/hobbies. Table 4.4 highlights how the intervention differed from the usual care. As peer interactions were unstructured (and not counted) in the buddy system, the mid and end of study surveys included questions about number of interactions with faculty advisors and buddies (see Appendix N).

Table 4.4

Treatment vs. Comparison Group Interventions

Intervention	Treatment Group	Comparison Group
Peer mentor	Matched by minority status	Matched by interests/hobbies
Number of mentee-peer mentor interactions	5	Unspecified
Peer mentor interactions	Structured	Unstructured
Faculty advising sessions	6	One in-person meeting per year required
Networking events	2	--

Recruitment of participants. The study population included 70 first-year students admitted into the Doctor of Physical Therapy program in 2019. All first-year DPT students received recruitment materials asking them to complete the CEQ at baseline. Participants were issued a participant identification number by the researcher to allow for baseline comparisons between REM students and their White peers. After that, REM DPT students self-selected into a treatment group (see Figure 4.3). The treatment group participated in the networked mentoring model, and the comparison/usual care group received informal mentoring through the buddy system.

Power analysis. A power analysis was conducted a priori to determine the required sample size for this study using the G*Power software program. Powered at 0.8, with an estimated effect size of 0.5, and with α=.05, the calculated required sample size was 26. Guidance for utilizing these standards was established by Shadish et al. (2002), who report that for "social science practice, Type I error rates are usually set at α=.05" (p. 45). One strategy to increase power in this study could have been to increase the sample size (Shadish et al., 2002). The study hoped to enroll 10 students in the intervention group and twenty students in total in the comparison groups to increase power (Shadish et al., 2002).

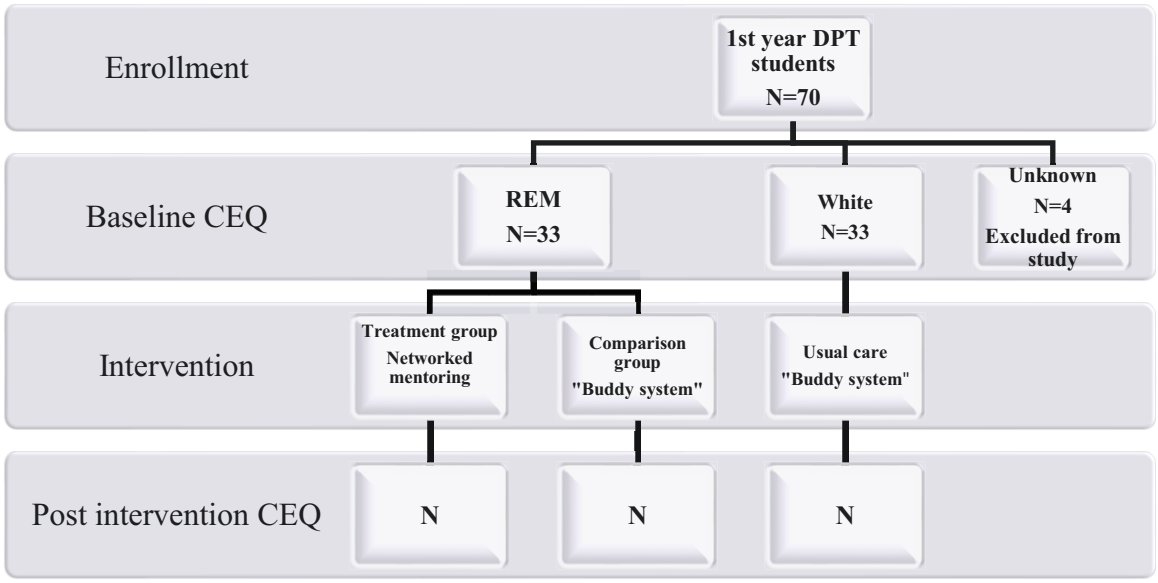

Figure 4.3 Recruitment of first-year REM DPT students who will participate as mentees in the networked mentoring model.

Recruitment of peer mentors. The population of peer mentors included 34 second-year DPT students who self-identified as a racial/ethnic minority. Figure 4.4 outlines the protocol for recruiting peer mentors for participation in the networked mentoring model. In addition to self-identifying as a racial/ethnic minority, an additional inclusion criterion included maintaining a cumulative GPA of greater than 3.0. The institution under study considers students with a GPA under 3.0 to be at risk of not being successful, and students are placed on academic probation. As the networked mentoring model relies on peers as role models, maintaining this academic standard was vital for peers to share successful academic strategies with mentees. Additionally, recruiting peer mentors who have a cumulative 3.0 GPA is consistent with the protocol by Yomtov et al. (2017), who matched peer mentors with first-year university students.

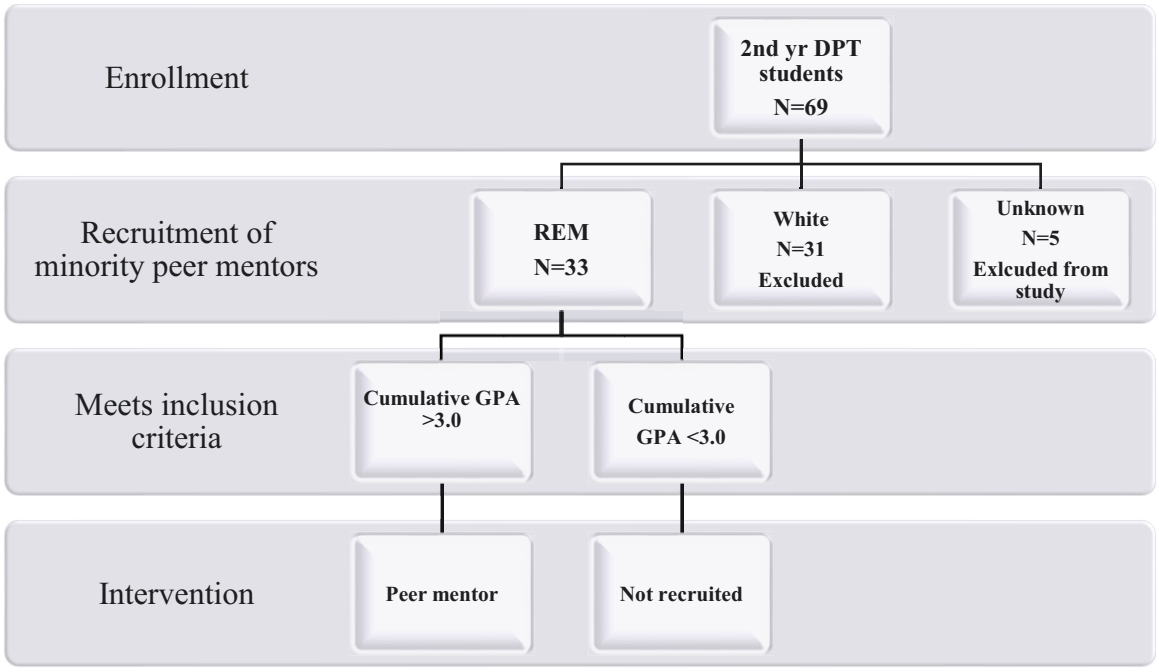

Figure 4.4 Recruitment second-year REM DPT students who will serve as peer mentors in the networked mentoring model.

Matching mentoring teams. The researcher matched mentoring teams, which included a faculty mentor, peer mentor, and first-year mentee. Given faculty demographics, it was anticipated that most faculty mentors would be White. Additionally, given the small number of REM students in the first and second-year classes, it was unlikely that racial concordance would be achieved between mentees and peer mentors. Instead, it was anticipated that mentees and peer mentors would leverage a shared experience as REM DPT students at a predominantly White institution. Figure 4.5 highlights the opportunities for shared learning between members of the networked mentoring team.

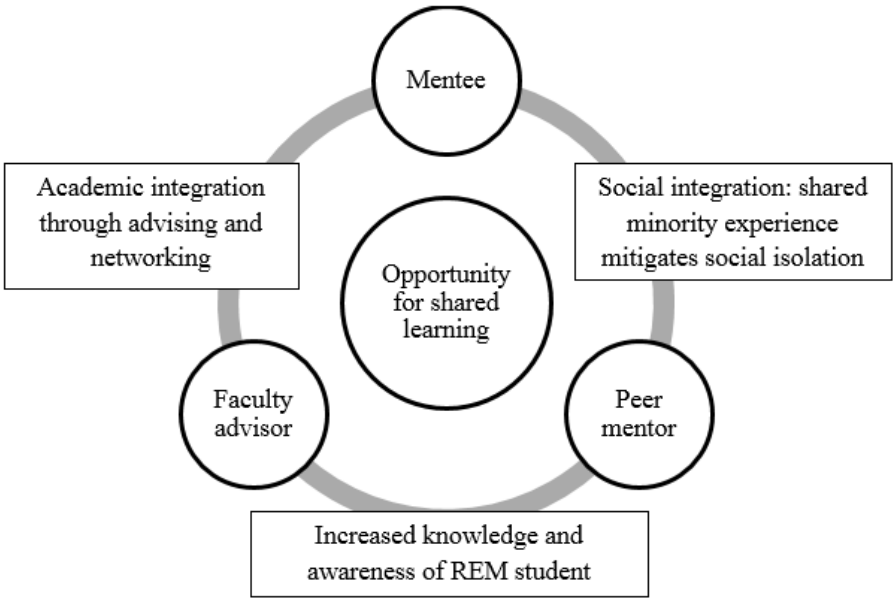

Figure 4.5 Networked mentoring model and opportunities for shared learning. Adapted from Spivey-Mooring, T., and Apprey, C. B. (2014).

Mentoring the Mentors

Lewis et al. (2016) trained faculty and peer mentors with an introduction to self-determination theory (Deci & Ryan, 1985) and social capital theory with recommendations for implementing these frameworks into mentoring sessions with protégés. In this intervention study, faculty and peer mentors completed online training modules housed in the institution's online learning platform, Desire2Learn. An introductory video introduced faculty and peer mentors to the R/CID model (Sue & Sue, 2012) and CCW (Yosso, 2005) with implications for mentee interactions.

Faculty training. Facilitating productive relationships between faculty and students of color involves more than providing minority faculty role models. Faculty must appreciate the unique needs of minority students (Guiffrida, 2005). Faculty were introduced to the five-tier mentoring model proposed for academic advisors to enhance student success in graduate

education (Wright-Harp & Cole, 2008) as well as strategies for mentoring ethnic minority graduate students (Chan, 2008). Faculty mentor professional development (PD) topics included: (a) an introduction to networked mentoring and the racial/cultural identity development model (Sue & Sue, 2012) and community cultural wealth (Yosso, 2005), (b) needs assessment findings, (c) from advising to mentoring, and (d) mentoring ethnic minority graduate students (see Appendices P-S). Additionally, faculty PD focused on strategies to maximize peer mentor interactions. The in-person faculty mentor professional learning community (PLC) meeting with the researcher facilitated discussions around creating shared learning spaces with peer mentors and strategies to mitigate the power differential between faculty and second-year DPT students.

Peer mentoring training. The first month of the intervention (September 2019) was dedicated to peer mentor professional development. Peer mentors completed four online PD modules designed to be completed asynchronously. Topics included: (a) an introduction to networked mentoring and the racial/cultural identity development model (Sue & Sue, 2012) and community cultural wealth (Yosso, 2005), (b) the power of peer mentoring, (c) social belonging and academic outcomes, (d) having crucial conversations, and (d) the three pillars of mentorship (see Appendices T-W). Each module included an assigned reading, presentation, or discussion board post to create a community of mentors and to attempt to ensure that peer mentors reviewed training materials. An in-person meeting between the researcher and peer mentors allowed for questions and concerns to be addressed before the commencement of the intervention. Additional online materials for peer mentors included potential resources that could be shared with mentees. Peer mentors met with the researcher in November 2019 for an in-person professional learning community meeting to share peer mentoring strategies and modifications.

Intervention

First-year REM DPT students participated in the two-semester long mentoring and networking program beginning in October 2019. It is vital to provide specific information about the dosing of the intervention, specifically the minimal intervention needed to deliver treatment at the effective strength (Leviton & Lipsey, 2007). As described, mentoring programs vary in their dosing, with some mentors meeting with proteges once a week and others meeting less frequently for longer periods. In this study, participants received six faculty mentoring sessions, five peer mentoring sessions, and attended two networking events. The details of each interaction are discussed next.

Peer mentoring. Walton et al. (2012) highlight that a short-term manipulation of the sense of belonging to first-year students can lead to increased academic motivation. In this intervention study, first-year REM DPT students and peer mentors had an established shared interest pursuing a career in physical therapy and shared identity as REM students at a predominantly White university. The shared minority experience leveraged the racial/cultural identity development model (Sue & Sue, 2012), mainly if the first-year REM DPT student was in the resistance and immersion phase, feeling increased respect for minority values and rejecting the dominant culture. Appendix X outlines the suggested peer mentoring interactions.

Initial meetings with participants and peers further established a social connection, and mentors were encouraged to elicit information about general interests, as well as motivation for entering the profession, and goals for the future. This emphasis on social connection drew upon elements of community cultural wealth social capital (Yosso, 2005). Establishing a social connection was also an attempt to undermine any social identity threats should the participant have felt that they did not belong at the institution under study.

Faculty mentoring. Initial meetings with faculty also emphasized establishing a social connection with a discussion around general interests, as well as motivation for entering the profession, and goals for the future (see Appendix Y). Recommended activities were based on the five-tier mentoring model for academic advisors to enhance student success in graduate education. Critical elements included: commitment to the mentoring process, establishing mentoring venues, serving as a role model, employing successful tools, and monitoring mentee's progress (Wright-Harp & Cole, 2008). Components of role modeling included mirroring an excellent professional image and conveying a passion for the culture of the profession. Monitoring progress included addressing coursework, professional development, and participants' concerns and challenges (Wright-Harp & Cole, 2008).

Faculty and peer mentor activities. Faculty and peer mentors met twice over the study period. Peer mentors shared their experiences as minority students at a PWI and advocated for participant needs. Faculty received guiding questions to facilitate interactions with peer mentors and to aid in decreasing the power imbalance between faculty and second-year REM DPT students (see Appendix Z). The guiding questions were based on the interview protocol from Chan et al. (2015).

Networking events. Students who have a sense of belonging to an intellectual task can demonstrate an increase in motivation (Walton et al., 2012). Additionally, if students learn that their group belongs in a specific context, there is a large increase in motivation (Walton et al., 2012). For this reason, networking events included introducing REM DPT students (both participants and peer mentors) to minority leaders in the field. Participants, faculty, and peer mentors attended two networking events hosted at the institution. The first networking event focused on service-learning opportunities in Guatemala and Jordan. The second networking

event highlighted post-graduate opportunities and included a panel of alumni and minority faculty who shared their motivation to pursue careers in academia.

Data collection

The researcher collected qualitative data at the mid-study period (via open-ended survey questions) and the end of the study period (via open-ended survey questions and focus group interviews). Figure 4.6 outlines the sequential mixed methods design. While there were periods when both quantitative and qualitative data were collected concurrently (phase two and three), the study began with a quantitative strand, the findings of which informed the qualitative strand. The data was not mixed until both data types were analyzed, compared, and inferences were made.

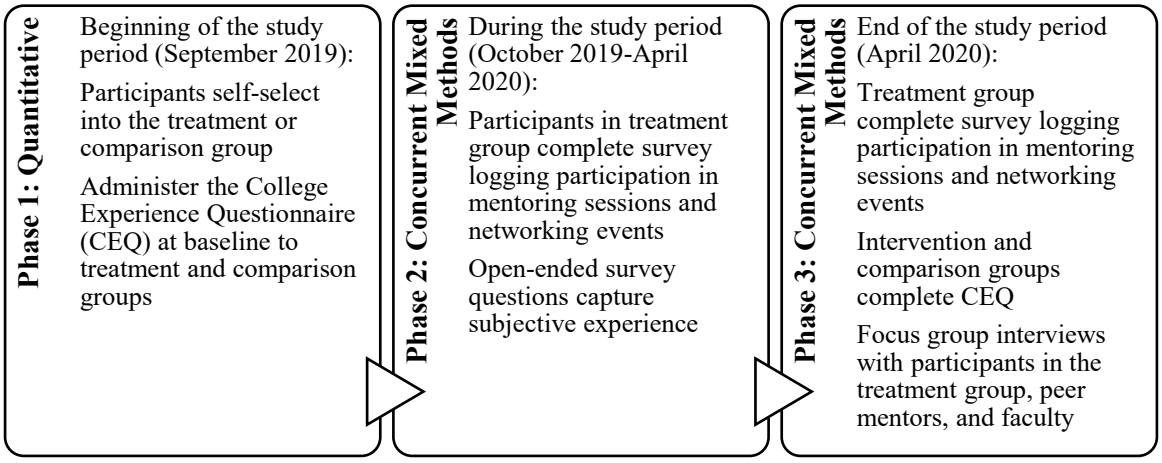

Figure 4.6 Data collection in a mixed methods (explanatory sequential) design. Figure adapted from Mertens (2018).

College Experience Questionnaire. The College Experience Questionnaire (CEQ; Spivey-Mooring & Apprey, 2014), designed to assess graduate students' sense of belonging and

connectedness, was administered electronically pre and post-intervention to evaluate program effectiveness. Survey data were collected and managed using the REDCap electronic data capture tools hosted at the institution. REDCap (Research Electronic Data Capture) is a secure, web-based software platform designed to support data capture for research studies (Harris et al., 2019).

Mid program and end of study period surveys. First-year REM DPT students and peer mentors completed surveys at the mid and end student points to evaluate fidelity of implementation. Additionally, mentee and peer mentor responses to open-ended survey questions allowed for iterative changes to be made to the program as needed.

Focus group interviews. The researcher conducted focus group interviews with participants, peer mentors, and faculty (separately) at the end of the study period. Focus group interviews were limited to eight participants to allow for maximum participation. Conversations about race can enlighten researchers about how subjects experience race in educational settings and can be a catalyst for promoting equity in education (Coles-Ritchie & Smith, 2017). However, there are psychological risks associated with discussing race. The researcher advised participants that they could decline to answer any question which caused discomfort and could end their participation in the focus group at any time. Focus group interviews were audio-recorded and transcribed.

Data analysis

College Experience Questionnaire. The researcher presented descriptive statistics on the pre and post-intervention CEQ scores for the intervention and comparison groups. Comparing pre- and post-test scores on the College Experience Questionnaire helped to

minimize error and determine whether some subjects responded more strongly to the intervention than others.

Cross-Cultural Psychological Capital Survey (Cross-cultural PsyCap). The researcher presented descriptive statistics for the Cross-Cultural PsyCap and tested the null median of the difference between the pre- and post-test scores for the intervention and comparison groups using the Wilcoxon signed-rank test.

Open-ended survey responses and focus group interviews. To analyze qualitative data from open-ended survey responses and focus group interviews, the researcher completed the six-step process for thematic analysis identified by Braun and Clarke (2006). Data analysis concurrent with data collection allowed for the development of themes and for correcting blind spots throughout the study period (Miles et al., 2014). First cycle coding was completed using descriptive coding. After the second cycle coding, codes were collapsed into pattern codes to form the basis of the data-driven themes.

Data Collection Summary Matrices. The data collection summary matrices connect the research questions to their respective indicator or construct, and instrumentation (see Appendices AA-DD). Both process (Appendix AA) and outcome evaluation research questions (Appendix BB-DD) are included. A framework for analyzing data in this mixed methods study is highlighted (Onwuegbuzie & Teddlie, 2003).

Limitations of the Study Design

Unlike the gold standard of experimental science (the randomized control trial), the quasi-experimental design, used here, provides less compelling support for causal inference because of decreased opportunity for strong counterfactual inference (Shadish et al., 2002). As participants in this study self-selected into a treatment group, there is the risk that participants

differ from their comparison group at baseline. This could potentially provide alternative explanations for any observed effect of the intervention. A randomized control trial would make alternative explanations less likely because there is a higher probability that the intervention group is similar to a comparison group (Shadish et al., 2002).

Additionally, as with most experiments, this study was highly context-specific (Shadish et al., 2002). The study population was more racially diverse when compared to the population of physical therapy students in the country, limiting generalizability. An additional limitation of the study design included a narrow list of measures. Gloria et al. (1999) used 10 instruments to determine whether higher levels of social support, more comfort in the university environment, and positive self-belief could increase persistence decisions among African American undergraduate students. While a more exhaustive list of measures could have been compiled for use in this study, to be sensitive to demands on participant time, measures were limited to surveys and focus group interviews.

Strengths of the Study Design

The use of the values branch and constructivist framing (Mertens, 2018) was prioritized in this study. While the lack of randomization was a weakness in some respects, the study design did align with the ethics and participant acceptance of design in this study. By self-selecting into either the intervention or the comparison group, participants had more autonomy and control over their participation in this study (Mertens, 2018).

It is possible that social isolation could have decreased, and university connectedness could have increased during the two-semester study period regardless of the intervention. Pre- and post-test administration of the CEQ could have helped determine the effects of maturation. Another method would have been to conduct multiple pre-tests to establish the maturation trend

related to social isolation in this context. However, this would not have been feasible given the timeline of the study. Multiple pre-tests will be considered for future research.

Researcher Reflexivity Statement

As this study included a qualitative component, with the researcher serving as a research instrument (Lochmiller & Lester, 2017), a reflexivity statement is warranted. Being raised as an Indian woman in apartheid South Africa informs the researcher's decision to operationalize the construct of minority as referring to both a lack of size and power. This influences the researcher's decision to include Asian students, who are not underrepresented in DPT programs, as minority students in the intervention group. The researcher's personal experience and a review of the literature (Turner et al., 1999) confirms that strength in numbers does not protect Asian students or faculty from discrimination in the academe.

The researcher acknowledges a strong commitment to social justice and an equity pedagogy and being motivated to see minority students achieve the same level of success as their White counterparts. To increase transparency, the researcher acknowledges herself as a source of bias in this study as an academic advisor to students self-selected into the intervention group. The cross-cultural knowledge, skills, and awareness gained through the focus of this scholarly work are infused into the researcher's interactions with all students and could have impacted the outcome of the study. To increase trustworthiness, the researcher kept a researcher journal to detail experiences as a participant-observer embedded in the context (LeCompte & Goetz, 1982).

Chapter 5: Results and Discussion

The purpose of this dissertation was to examine whether mentoring from faculty and racially concordant mentoring from peers could mitigate social isolation and promote a sense of belonging among first-year REM DPT students. An additional purpose was to examine how participation in this program contributed to DPT faculty cross-cultural psychological capital and DPT peer mentors' socialization into the physical therapy profession. The purpose of this chapter is to discuss the findings of the intervention, a networked mentoring model for first-year REM DPT students at one institution. A detailed description will account for the process of the intervention implementation.

The findings of the process evaluation research question will be discussed first, followed by a discussion of the results of the outcome research questions. Links to the literature, theoretical frameworks, and relationship to practice will be highlighted. Study limitations and implications for practice and future research follow. Finally, the conclusion will outline recommendations to institutional stakeholders and other health sciences educational professionals.

The following research questions guided data analysis:

RQ1: How has the study implementation adhered to or differed from the proposed implementation procedures?

RQ2: To what extent does participation in a networked mentoring model mitigate social isolation for first-year REM DPT students?

RQ3: To what extent does participation in a networked mentoring model foster sense of belonging for first-year REM DPT students?

RQ4: How does participation in a networked mentoring model contribute to DPT faculty's cross-cultural psychological capital?

RQ5: How do REM DPT peer mentors guide faculty to meet the unique mentoring needs of first-year REM DPT students?

RQ6: How does participation in a networked mentoring program contribute to second-year REM DPT students' socialization into the physical therapy profession?

The Intervention

The intervention took place between September 2019 and April 2020. The first month of the intervention was dedicated to participant recruitment and mentor PD. The researcher hoped to enroll a sample of 10 REM first-year student mentees, 10 first-year DPT students in a comparison group, as well as 10 second-year REM DPT, peer mentors and 10 faculty mentors. The mentoring intervention commenced in October 2019. During the last two months of the intervention, the institution closed its campus to maintain social distancing due to the Coronavirus 2019 (COVID-19) outbreak. Subsequent changes to the intervention and data collection procedures are described.

Recruitment, Consent, and Sampling

The study population included 70 first-year students admitted into the institution's DPT program in 2019, 34 second-year REM DPT students, and 22 core faculty members. In September 2019, program staff sent recruitment emails to all first-year DPT students (see Appendix EE), asking them to complete the College Experience Questionnaire (CEQ) as well as a mid-study and end of study survey. Staff distributed recruitment materials a total of three times. Only one participant, a White female first-year student, consented into the comparison group. The researcher issued the participant an identification number to allow for baseline comparisons

between REM students and the comparison group. No intervention was provided to the participant in the comparison group.

First-year mentees. Program staff also distributed recruitment materials to 33 first-year REM DPT students to participate in the networked mentoring model (See Appendix FF). The researcher did receive questions via email about the program, particularly around time commitment. Overall, the response rate was low. It is possible that the number of meetings and time commitment deterred students from participating. In retrospect, the researcher should have offered both the intervention and comparison groups incentives for participation. Additionally, an in-person meeting inviting all first-year REM DPT students to learn more about the study may have been beneficial. In the narrative comments of the mid-study survey, one of the participants recommended advertisement beyond email to share information about this study. Program staff distributed the recruitment email to first-year students a total of three times. In September 2019, six first-year REM DPT students consented into the intervention group. After the first networking event in October 2019, two additional first-year REM DPT students consented into the study. A total of eight first-year REM DPT students formed the intervention group (see Table 5.1).

Peer mentors. Program staff distributed recruitment materials to second-year DPT students in September 2019 (see Appendix GG). The sample of peer mentors included 34 second-year DPT students who self-identified as belonging to a racial/ethnic minority upon application to the program. In addition to self-identifying as a racial/ethnic minority, an additional inclusion criterion included maintaining a cumulative GPA of greater than 3.0, to identify strong academic role models. Despite the time commitment, which included 10 hours of online training and mentee and faculty mentor meetings, recruiting peer mentors proved to be

less challenging. The modest stipend ($100) may have offset some of the costs of participating as a peer mentor. However, in narrative comments, participants describe additional motivation for participating, such as leveling the playing field for other minority students.

Faculty mentors. Program staff distributed recruitment materials to all DPT faculty in September 2019, asking them to complete the Cross-Cultural Psychological Capital survey twice (see Appendix HH). Additionally, program staff distributed recruitment materials to DPT faculty, asking them to serve as faculty mentors in the networked mentoring model (see Appendix II). Consent materials were distributed to all participants (see Appendices JJ-LL).

Participant Characteristics

First-year mentees. As described, eight first-year students consented into the intervention group, and one student consented into the comparison group. The intervention group included four female and four male students, ranging in age from 24 to 27 years old (avg. 25.6 years; see Table 5.1). The student in the comparison group self-identified as a White female.

Table 5.1

Demographics of Study Sample and Intervention Group.

Demographic Data	First-year DPT students (N=70)	Intervention group (n=8)
Gender		
Female	49 (70.0%)	4
Male	21	4
Ethnicity		
African American/Black	3 (4%)	2
Asian/Pacific Islander	15 (21.4%)	3
Hispanic	9 (12.9%)	2
Native American/Alaskan Native	1 (1.4%)	0
White	33 (47.1%)	0
Mixed race	5 (7.1%)	1
Unknown	4 (5.7%)	0

Peer mentors. The eight peer mentors included five female and three male students. Four students self-identified as Black/African American, three identified as Hispanic, and one student as Asian.

Faculty mentors. In September 2019, faculty in the physical therapy department included 22 full-time and part-time core faculty members (excluding the Department Chair and the researcher). The sample included 18 females (81.8%) and four males. Faculty self-identified as White (86.4%) or Asian (13.6%). Six faculty consented to participate as mentors, and six faculty consented into the comparison group. All faculty completed the Cross-cultural Psychological Capital survey (Cross-Cultural PsyCap) at the beginning and end of the study period. One of the faculty members in the intervention group mentored two students, and the researcher served as a mentor to one participant. Faculty mentors included five females and one male who self-identified as White (n=5) or Asian (n=2). These five Assistant Professors and two Instructors had been employed at the institution as core faculty members for an average of five years.

Process of Implementation

The first month of the intervention (September 2019) was dedicated to faculty and peer PD as planned. Yomtov et al. (2017) highlight that one of the biggest critiques of mentoring programs is a lack of mentor training. In this study, mentors received access to online training modules housed on the institution's online learning platform, Desire2Learn. The learner management feature of the platform allowed the researcher to monitor the number of user logins and the amount of content completed.

Peer mentor professional development. Peer mentors completed a single item pre-training quiz before completing five online training modules, designed to be completed

asynchronously. The quiz question was, “I feel confident in my ability to serve as a peer mentor” Response options included (a) *Strongly agree*, (b) *Mainly agree*, (c) *Mainly disagree*, or (d) *Strongly disagree.* Training module topics included: (a) an introduction to networked mentoring and the racial/cultural identity development model (Sue & Sue, 2012) and community cultural wealth (Yosso, 2005), (b) the power of peer mentoring, (c) social belonging and academic outcomes, (d) having crucial conversations, and (d) the three pillars of mentorship (see Appendices T-W). Each training sub-module included a narrated PowerPoint presentation, an assigned reading or presentation, a self-assessment activity, or a discussion board post. Peer mentors completed the single item post-training quiz at the end of module completion. An in-person meeting between the researcher and peer mentors at the beginning of the study period allowed for questions and concerns to be addressed before the commencement of the mentoring sessions.

Faculty mentor professional development. As faculty participants consented into the study, the researcher met with each faculty mentor for thirty minutes to answer questions about the program in advance of the online mentor training. Faculty training topics included: (a) an introduction to networked mentoring and the racial/cultural identity development model (Sue & Sue, 2012) and community cultural wealth (Yosso, 2005), (b) needs assessment findings, (c) from advising to mentoring, and (d) mentoring ethnic minority graduate students (see Appendices P-S). An online discussion board prompted faculty to share multicultural mentoring strategies. Guiding questions included, “What strategies have you utilized to mentor students who are a different race or ethnicity than you?” and “What cross-cultural strategies might you utilize moving forward?” Optional readings followed PD modules.

Professional Learning Communities. Faculty and peer mentors had opportunities for collaboration and forming a community of learners through online discussion boards at the beginning of the intervention study. Additionally, faculty and peer mentors met with the researcher for an in-person professional learning community (PLC) meeting. Eight peer mentors met with the researcher in November 2019, and seven faculty mentors (including the researcher) met in December 2019. PLC meetings at the mid-study point allowed mentors to have the opportunity to practice strategies from the training modules, modify approaches as appropriate, and then share experiences after three months of mentoring. The PLC structure facilitated mentors moving through the four quadrants of the Vygotsky space, as described by Raphael, Vasquez, Fortune, Gavelek, and Au (2014) during the study period. Additionally, opportunities for discourse would align with the improvement science lens.

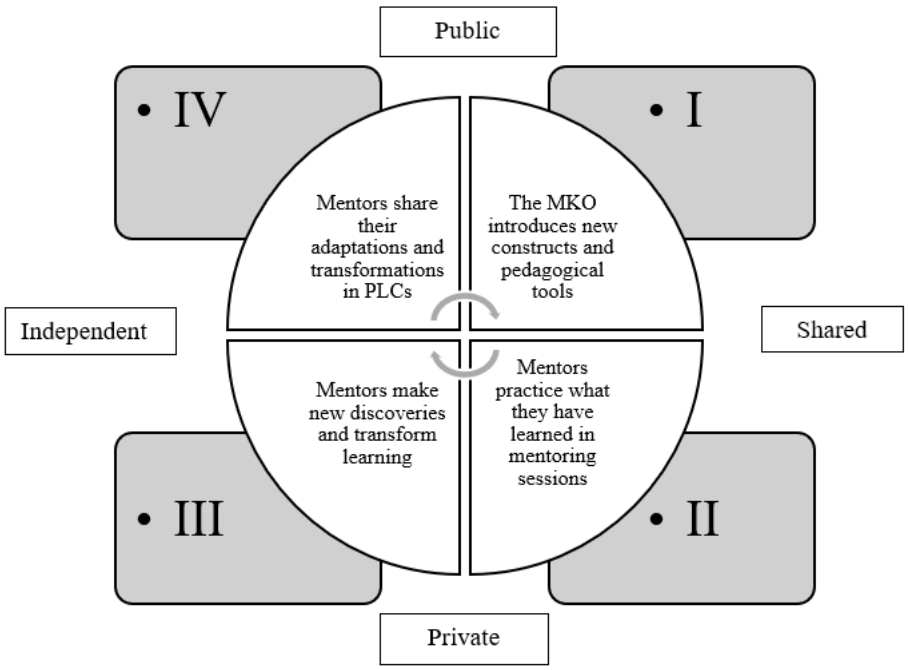

Figure 5.1 Leveraging PLC meetings to facilitate mentors moving through the Vygotsky space (Harré, 1983; Raphael et al., 2014). The MKO in quadrant one refers to the more knowledgeable other, described by Vygotsky (1978).

The Vygotsky space (Harré, 1983; Raphael et al., 2014) considers two critical dimensions for learning leveraged in this intervention study: (a) the continuum of social to independent learning, and (b) both public and private displays of learning (see Figure 5.1). In quadrant one of the Vygotsky space, the researcher, a faculty member at the institution, introduced fellow faculty and peer mentors to new constructs of pedagogical tools (multicultural mentoring or peer mentoring strategies) to address the identified problem of practice. Notable here is that Vygotsky (1978) viewed interactions with peers as an effective way to develop skills strategies necessary for success. Bailey, Jaggars, and Jenkins (2015) reiterate the importance of peer support and highlight that faculty are generally more interested in learning from their peers than an external consultant. After that, faculty and peer mentors moved into quadrants two and three, practicing what they had learned (mentoring minority participants), making discoveries, and transforming knowledge and skills. Finally, in quadrant four of the Vygotsky space, participants shared their adaptations and transformations (Raphael et al., 2014) during online discussions and in-person PLC meetings.

The core framework of improvement science is the plan-do-study-act (PDSA) cycle, where the researcher conducts rapid cycles of learning from practice (Lewis, 2015). In improvement science, variation in implementation and setting are important sources of information. Information gleaned from the fourth quadrant of the Vygotsky space served as a rich source of information to inform future mentoring sessions and PDSA cycles. During the faculty PLC meeting in December, one of the faculty mentors shared that they had been meeting with their first-year mentee and peer mentor together. This prompted other faculty mentors to consider incorporating group meetings moving forward. The positive effects of the group meetings are discussed further in the findings of outcome evaluation questions.

During their in-person November PLC meeting, peer mentors discussed mentoring meeting topics, including sharing advice about clinical education experiences and strategies for success in the clinical environment. Another mentor shared insecurity about mentoring a first-year student who was more academically successful. However, the researcher encouraged a focus on social belonging as opposed to studying strategies. Another peer mentor felt that they were able to provide much-needed friendship for a mentee who lived far from campus and expressed social isolation. As previously noted, the psychosocial aspect is one of the two main functions of peer mentoring (Terrion & Leonard, 2007), and the emotionally supportive relationship between mentor and mentee can increase connectedness to the university (Yomtov et al., 2017). Other mentors had questions about how closely to adhere to study recommendations for each of the mentee interactions. One of the peer mentor pre-requisite characteristics required to meet mentee psychosocial needs is communication skills and the ability to listen and understand mentee concerns (Terrion & Leonard, 2007). The researcher discussed the benefit of assessing the situation and evaluating the mentee's needs before proceeding, rather than implementing a prescribed intervention.

Mentoring sessions. Mentoring sessions began in October 2019 for most participants and in November 2019 for two participants who consented into the study later. Faculty and peer mentors received a list of suggested activities for each interaction (see Appendices X-Y). The researcher sent out biweekly calendar invites to faculty as reminders to schedule mentoring sessions with mentees and peer mentors. Guiding questions for faculty and peer mentor meetings were posted on the online learning platform (see Appendix Z).

In March 2020, the COVID-19 global pandemic resulted in the institution’s rapid transition to online learning. While in-person mentoring meetings had been encouraged at the

onset of the study, between March and April 2020, in-person meetings were not possible due to campus closure and social distancing measures. The researcher encouraged virtual mentoring meetings between participants and faculty and peer mentors. The researcher submitted IRB amendments to JHU eHIRB and the institutional IRB. IRB approval allowed for the completion of virtual focus group interviews in April 2020

Networking events. Two in-person networking events were hosted in October 2019 and January 2020, before the COVID-19 outbreak and campus closure. Each event was scheduled for one and a half hours in the evening at a location on campus. The researcher provided dinner for both events catered by a local social enterprise called Haley House. The mission of Haley House reads:

> Haley House uses food with purpose and the power of community to break down barriers between people, empower individuals, and strengthen neighborhoods. We believe in radical solutions: solving problems at their root by challenging attitudes that perpetuate suffering and building alternative models (Haley House, 2014).

The researcher arranged seating so that faculty, peer mentors, and participants sat together during each event to promote social integration, which includes relationships with peers and informal interactions with faculty (Tinto, 1993). The value of the social interactions with faculty is discussed later by participants in focus group interviews. The first half-hour of each event was dedicated to informal networking, followed by scheduled presentations.

The first networking event was held in October 2019. Two faculty members at the institution (one physical therapist and one occupational therapist) presented on service-learning projects to Guatemala and Jordan, respectively. The researcher recorded an interview with a minority student who had participated in the service-learning trip to Guatemala in 2018. The

event lasted two hours, thirty minutes longer than scheduled due to student questions to faculty presenters. Due to a shortage of time, the researcher posted the student interview for participants to view later.

The second networking event, a panel discussion, took place in January 2020. Panelists included two physical therapist alumni and two minority faculty members at the institution (one physical therapist and one genetic counselor). The researcher posed broad questions to the panel, including "What has been the greatest facilitator of your success?" and "What has been one barrier to your success during your professional journey? How did you overcome it?" Mentees and peer mentors were invited to submit questions ahead of time, as well as during the panel discussion. Study findings are discussed next.

Findings

Process Evaluation

The process evaluation question (RQ1) investigated how the study implementation adhered to or differed from the proposed implementation procedures. This process evaluation focuses on three elements to evaluate program integrity: project implementation, fidelity of implementation (dosage of mentorship received by participants), and context. Project implementation, whether the intervention was delivered as intended, is discussed first.

Project implementation. Through online training modules, the researcher introduced faculty mentors to the five-tier mentoring model, which included the following critical elements: commitment to the mentoring process, establishing mentoring venues, serving as a role model, employing successful tools, and monitoring mentee's progress (Wright-Harp & Cole, 2008). The researcher also introduced peer mentors to the three pillars of mentoring and the concept of mentoring on the run (Omatsu, 2002). Mid and end of study surveys captured the number of

mentoring sessions received, as well as participant perception of the critical elements of mentoring. First-year DPT students in the intervention group and one participant in the comparison group completed mid and end of study surveys in December 2019 and April 2020.

By December 2019, first-year mentees should have received four mentoring sessions with faculty and peer mentors and attended one networking event. Participants had an average of three mentoring sessions with faculty and two mentoring sessions with peer mentors (see Table 5.2). Additionally, six out of the eight participants had attended the Fall networking event. Likely contributing to the lower than expected mentoring sessions is that two participants joined the study late (after the networking event).

Table 5.2

Mid-Program Survey Findings

Critical elements of networking program	Intervention group (n=8)	Comparison group (n=1)
Faculty advising sessions Fall 2019	3	0
Peer mentoring sessions Fall 2019	2.13	0
Participants who attended the Fall networking event	6	0
My faculty advisor (Likert style questions)		
provides adequate time for quality mentoring	4.75	4
communicates between meetings	4.38	2
mirrors a professional image	4.88	5
conveys a passion for the profession	4.88	5
Participants who agreed that their faculty advisor reviewed the following areas during meetings		
Coursework	6 (75%)	0
Clinical education experiences	5 (63%)	0
Professional development	7 (88%)	0
My challenges thus far in the program	8 (100%)	0
My successes thus far in the program	8 (100%)	0
My concerns	8 (100%)	0

Note: Likert style question responses range from 1 = "*strongly disagree*" to 5 = "*strongly agree.*"

All participants in the intervention group agreed or strongly agreed that their faculty mentor provided adequate time for mentoring, communicated between meetings, mirrored a professional image, and conveyed a passion for the profession. All participants agreed that their mentor discussed their challenges and successes in their program as well as their concerns. Five participants noted that their mentors discussed clinical education experiences. Over the Fall semester, the participant in the comparison group did not have a meeting with their faculty advisor or peer buddy and disagreed that their faculty advisor communicated between meetings. The lack of an in-person meeting is in alignment with the advising model at the institution under study, which requires one in-person meeting a year. However, the participant in the comparison group did agree that their faculty advisor provided adequate time for quality mentoring.

When asked what their faculty mentors could do to improve the relationship, one participant in the intervention group remarked that their faculty mentor could check on them more during the semester. However, most participants felt that their mentors were succeeding in developing the mentoring relationship as expressed by one participant here “I think she is doing a great job trying to understand who I am and the same for me. So, it's a growing relationship.”

When asked what their peer mentors could do to improve the relationship, one participant recommended that their mentor find a more private area to meet. However, most participants expressed their satisfaction with the mentoring relationship as captured here “I like the bond we've built. I know he busy with school as well, but the fact he makes time for me, and we can talk about whatever, I appreciate.”

Positive mentoring experiences at the mid-program point included contributing to a sense of belonging as articulated by one participant here “Participating in the program has made me feel like I have more of a place here... I have my peers and friends, but it's provided another kind

of community that's different from academics or social." Participants valued connecting with a minority peer mentor who could identify with their experiences and backgrounds. One participant remarked on the selection of the mentors "The greatest strength is the selection of mentors and advisors. It helps to have understanding people who can [be] open-minded and sensitive to people's problems."

During the last month of the intervention, the researcher administered an end of study survey to determine project implementation during the Spring semester (see Table 5.3). At the time of data collection, participants had attended an average of 3.63 mentoring sessions with faculty and 3.75 mentoring sessions with peer mentors in the Spring semester. Six out of the eight first-year mentees participated in the Spring networking event. All participants in the intervention group agreed or strongly agreed that their faculty mentor provided adequate time for mentoring, communicated between meetings, mirrored a professional image, and conveyed a passion for the profession.

Participants did not have any recommendations for how their faculty mentor could improve the relationship, and few had suggestions for their peer mentors. Two participants recommended that their peer mentors initiate contact more often. Participants had insight into their qualities which made their relationships with their faculty mentors a success, including being receptive to feedback and willing to admit mistakes. Additionally, participants described specific skills for building a trusting relationship, including open and honest dialog and positive non-verbal communication skills.

Table 5.3

End of Program Survey Findings

Critical elements of the mentoring program	Intervention group (n=8)	Comparison group (n=1)
Faculty advising sessions Spring 2020	3.63	1
Peer mentoring sessions Spring 2020	3.75	1
Attended Spring networking event	6 (75%)	0
My faculty advisor (Likert style questions)		
provides adequate time for quality mentoring	4.75	4.5
communicates between meetings	4.63	2
mirrors a professional image	5	5
conveys a passion for the profession	4.86	5
Faculty advisor reviews the following areas during advising		
Coursework	8 (100%)	1 (100%)
Clinical education experiences	8 (100%)	1 (100%)
Professional development	7 (88%)	1 (100%)
My challenges thus far in the program	8 (100%)	1 (100%)
My successes thus far in the program	7 (88%)	1 (100%)
My concerns	8 (100%)	1 (100%)

Note: Likert style question responses ranged from 1 = "*strongly disagree*" to 5 = "*strongly agree."*

Fidelity of implementation. This section will focus on the dosage of mentorship received by participants. The researcher operationalized the ideal dose of mentoring in this study as a total of 10 mentoring sessions between first-year REM DPT students and faculty advisors and 10 peer mentoring sessions. The acceptable dose of mentoring included a total of five mentoring sessions between first-year students and faculty advisors and five peer mentoring sessions, as this would entail monthly touchpoints over the six-month study period. To facilitate data collection and optimize participation in instrumentation, data collection commenced before the end of the study period, which conflicted with semester examinations. Table 5.4 outlines

participation in study activities and instrumentation throughout the six-month intervention period.

Table 5.4

Participation Levels in Activities and Instrumentation

Activities and instrumentation	Intervention groups	Comparison groups
Faculty advising sessions (average over study period)	6.63	1
Peer mentoring sessions (average over study period)	5.88	1
Networking events attended (average over study period)	1.50	0
Faculty training	6 (100%)	--
Peer mentor training	8 (100%)	--
Completion of Instruments		
College Experience Questionnaire T1	8 (100%)	1 (100%)
College Experience Questionnaire T2	8 (100%)	1 (100%)
Participant mid-study survey	8 (100%)	1 (100%)
Participant end of study survey	8 (100%)	1 (100%)
Psychological Capital Survey T1	6 (100%)	6 (100%)
Psychological Capital Survey T2	6 (100%)	6 (100%)
Peer mentor perceived competence in mentoring T1	8 (100%)	--
Peer mentor perceived competence in mentoring T2	3 (37.5%)	--
Peer mentor mid-study survey	8 (100%)	--
Peer mentor end of study survey	8 (100%)	--

Note: T1 denotes the beginning of the study period "Time 1" and T2 denotes approaching the end of the study period "Time 2."

At the time of data collection, first-year mentees had received an average of 6.63 faculty mentoring sessions. Some participants reported receiving as many as nine faculty mentoring sessions, and one participant reported receiving four faculty mentoring sessions. There is some discrepancy between the perceived number of peer mentoring sessions delivered and the number received. Peer mentors reported delivering an average of seven mentoring sessions over the study

period. However, peer mentoring sessions received ranged between three and nine sessions and participants reported receiving an average of 5.88 peer mentoring sessions. While less than the ideal dose of mentoring, partially due to data collection before the end of the study, both faculty and peer mentoring sessions received by participants fell within the operationalized acceptable dosage of mentoring. Additionally, all participants in the intervention group had attended at least one networking event, and four participants had attended both events. One hundred percent of faculty mentors participated in networking events. Over the study period, the student in the comparison group had one faculty advising session and one phone call with her peer buddy.

Completion of instrumentation at both study time points was excellent, except for the peer mentor's perceived competence in the mentoring quiz, which was to be completed at the end of the online peer mentor training. Only three mentors completed the single item quiz, available at the end of the online training, possibly indicating that not all mentors completed all online training modules. However, peer mentor confidence in mentoring was captured again in the mid and end of study surveys.

Contextual factors. Important contextual factors considered included the characteristics of the organization as well as the mentors delivering the program (Saunders et al., 2005). Process evaluation at the contextual level focused on the institutional barriers and facilitators, which impacted the delivery of mentoring sessions to the participants. At important contextual consideration included campus closure due to the COVID-19 global pandemic. In focus group interviews, faculty mentors identified the challenges of scheduling mentoring sessions with first-year mentees and meetings with second-year peer mentors due to competing priorities and conflicting schedules. One faculty mentor described the challenges of syncing up her schedule with the first-year mentees:

> It was a challenge scheduling since I had total opposite schedule of the Year Ones. Teaching predominantly in Year Two, and [supervising students] in the Center … I was busy during those noon times. So, unfortunately, it was usually at the end of the day, and I would have loved to have been able to have better, just more of a schedule that could click a little bit more. I think it was challenging to find a good time and have an extended period of time to meet (Focus group 3, Participant 3).

In the end of study survey, peer mentors articulated the difficulty of scheduling mentoring sessions when campus was closed due to social distancing measures. While the researcher encouraged all mentors to transition to virtual mentoring, peer mentors were also adapting to the rapid shift to online learning as captured in these narrative comments:

> I felt confident reaching out to check in with her and ask if she needed any help, especially during the transition to online learning. However, due to the current conditions, I did not give enough time to my mentee since our cohort was also going through a transition. I did my best to reach out and offer my advice and connect with her via text message (Peer mentor survey, narrative comments).

Process Evaluation Summary

This process evaluation focused on three elements: project implementation, fidelity of implementation, and context. The researcher planned to deliver one month of online mentor training followed by 10 faculty and peer mentor sessions and two networking events. While all faculty and peer mentors accessed online training modules, it is unclear if mentors completed all training modules.

Ultimately, first-year mentees reported receiving 6.63 faculty mentoring sessions, 5.88 peer mentoring sessions, and all participants attended at least one of the networking events (see

Table 5.4). Early data collection, campus closure to the COVID-19 global pandemic, and the rapid shift to online learning contributed to the lower than expected received mentoring sessions. However, all first-year mentees agreed or strongly agreed that they received the critical elements of mentoring during the study period. There was discrepancy between the number of peer mentoring sessions delivered and the number reported received by participants. Peer mentors reported delivering an average of seven mentoring sessions over the course of the study, greater than the number mentees reported receiving. It is possible that there was a discrepancy as what counted as a mentoring sessions. As part of their training, peer mentors were introduced to the concept of mentoring on the run, which describes a shift from thinking about mentoring as a formal interaction to infusing mentoring into daily interactions (Omatsu, 2002). Peer mentors were educated that every interaction is potentially a mentoring interaction and may have counted informal interactions with mentees as mentoring sessions, resulting in the discrepancy.

Faculty and peer mentors met an average of twice over the intervention period (see Table 5.7). At the end of the study survey, peer mentors described not having the opportunity to meet with faculty mentors due to campus closure. Additionally, during faculty PLC meetings, faculty described meeting with first-year mentees and peer mentors together. This strategic decision making was in part due to scheduling challenges and to put first-year mentees at ease and is discussed later in the outcome evaluation. This modification likely contributed to the less than ideal number of 1:1 faculty and peer mentor meetings, although it may have contributed to enhanced mentoring. The outcome evaluation is addressed next.

Outcome Evaluation

Several outcome measures evaluated the proximal outcomes among the three groups of participants (see the logic model and integrative theory of treatment). First, the effect of the

networked mentoring model on the first-year mentees is discussed. After that, the researcher will address the effect of the mentoring relationship on faculty mentor cross-cultural psychological capital. Finally, the researcher will address how peer mentors advocated for the unique needs of minority students and how the mentoring program contributed to peer mentor socialization into the physical therapy profession.

Mitigating Social Isolation and Fostering Belonging

The first outcome evaluation research question (RQ2) investigated to what extent the networked mentoring model contributed to the mitigation of social isolation for first-year REM DPT students. The second outcome evaluation question (RQ3) focused on whether participating in the networked mentoring model fostered a sense of belonging for first-year REM DPT students. The results of the College Experience Questionnaire will be presented, followed by a discussion of themes from focus group interviews with first-year REM DPT students in the intervention group.

College Experience Questionnaire. The College Experience Questionnaire (CEQ; Spivey-Mooring & Apprey, 2014) is designed to assess graduate students' sense of belonging and university connectedness. Participants in the intervention and the participant in the comparison completed the CEQ at the beginning of the study period (T1) and in April 2020 (T2). The intervention group scored lower on the university connectedness and environment subscales and slightly higher on the university alienation subscale compared with the participant in the comparison group at the beginning of the study period (T1). However, a single student in the comparison group limits the usefulness of comparison data.

Table 5.5

College Experience Questionnaire Findings

CEQ Composite Score and Subscales	T1 Mean (SD)	T2 Mean (SD)
Intervention group (n=8)		
CEQ Composite Score	74.43 (10.67)	77.38 (7.95)
University connectedness	24.86 (3.48)	25.63 (2.56)
University environment	27.63 (4.34)	27.75 (3.62)
University alienation	16.25 (2.71)	16.13 (1.96)
Comparison group (n=1)		
CEQ Composite Score	80	82
University connectedness	27	26
University environment	32	33
University alienation	16	17

At the end of the study period (T2), the intervention group had a lower CEQ composite score compared with the student in the comparison group. At the end of the study period (T2), the intervention group scored lower on all three subscales compared with the student in the comparison group. Notable is the large standard deviation in the intervention group CEQ composite scores at T1 and T2.

Focus group interviews. The researcher conducted two virtual focus group interviews with first-year mentees nearing the end of the study period in April 2020. Each focus group included four mentees. Interviews were audio-recorded and transcribed. The researcher checked the transcrip for accuracy and completed the six-step process for thematic analysis identified by Braun and Clarke (2006). Four themes emerged from focus group interviews: foreign culture, someone like me, connection, and future-oriented. The codebook can be found in Appendix MM.

Foreign culture. Codes under this theme included graduate school and the external environment. Participants noted a drastic change transitioning from undergraduate education to

graduate school and had trouble navigating the foreign environment of a health sciences program. Integrated clinical education was also uncharted territory for mentees that faculty and peer mentors helped them navigate. Here a participant describes the challenges with the transition to graduate school: “It’s completely different from undergrad and that’s the only basis that I’ve had and not really knowing if I need to put in more effort. Am I putting in too much effort? Really, I guess, finding that balance” (Focus group 2, Participant 2). Another participant describes the benefit of having peer and faculty mentors reach out proactively to offer support:

> It’s pretty stressful, and I’m not the type to seek out help that much, help as in emotional support, but when you have a faculty and student advisor reaching out to you, I think that’s pretty fantastic to have because when you meet up, you get to vent and share all your concerns and they can give good advice. I think that’s helpful for persisting in this kind of program. (Focus group 3, Participant 4)

Participants also described the challenge of moving to a new city with a unique culture and pace as captured by one participant here: “For me, it’s kind of just been an adjustment trying to move to the city because it’s a totally different environment than I’m used to” (Focus group1, Participant 1). Another participant described the unique aspects to the external environment:

> For me, it’s fast-paced. Accents! It’s just, to me, it seems like people move really quickly and their minds are going really quickly. Trying to catch up to that while I’m a little more chill environment and trying to get up to speed. (Focus group 1, Participant 2)

Someone like me. Codes under this next theme included peers, faculty, graduates, and a shortage of minority role models. Participants valued having peer mentors who had a shared minority experience and had successfully navigated the first year of the DPT program. One

participant described their mentor as “Someone who has gone through the whole length of PT school, [and] came out okay” (Focus group 1, Participant 4). Another mentee elaborated:

> I feel like we can relate more to a second-year, especially one of color, and it’s really due to the fact that they’re right there. They were just where we’re at, so they can resonate more than faculty who haven’t been a student in years. (Focus group 1, Participant 1)

When describing the importance of receiving advice from a mentor who belonged to the same race group, one participant shared, “A few of the professors have told me that, but it doesn’t click until it’s someone like me” (Focus group 1, Participant 4).

Participants also valued hearing from alumni of color at networking events, which helped them envision their future selves: “Seeing past graduates of the [institution] talk about their struggles was an eye-opening experience. Nobody comes to the [program] as a full package, but you definitely leave as a full package” (Focus group 1, Participant 1). Hearing from graduates of the program also reinforced mentees’ belief in the institution, as captured in this excerpt:

> It was telling about the amount of people that would come back and talk about their experience at the [institution]. I think it says a lot about the school and the program at the [institution] and the faculty and their students here. (Focus group 1, Participant 2)

Networking events also provided opportunities to interact with faculty outside of the classroom and highlighted similarities between students and faculty as captured here: “It’s sort of like less intimidating to talk to you guys in some respect because once you guys start talking to each other, it’s like ‘Oh! They’re just like us in some ways!’” (Focus group 1, Participant 3). Interacting with faculty outside of the classroom also helped to break down some of the barriers between students and faculty. While the power differential was not eliminated, one participant described the change:

> I think it's because when we see you guys stand in front of us, all 70 of us, we see it as an authoritative figure, but when we meet with you one-on-one outside of the classroom, it's more on a personal level. So that breaks down the walls of communication between us. (Focus group 1, Participant 1)

However, despite interacting with and connecting with faculty mentors in a more social environment, ultimately, participants highlighted the need for more faculty of color. Participants noted some diversity in their peer groups but less so in the faculty. Participants emphasized that the lack of representation did not contribute to feelings of exclusion but could contribute to minority student success in the long run:

> It could be more diverse in terms of ethnic groups and especially in the faculty, but I don't feel excluded. I feel still very welcome, and with my peers, I don't feel discriminated against, so it's a very welcome environment. I just feel like I could relate more if there were more ethnic groups, especially among faculty. Just seeing the faculty as a minority and as a minority group would be more motivating. (Focus group 1, Participant 1)

Participants felt that increased representation in the faculty would highlight role models who had faced bias and stereotype and yet overcame those barriers and achieved success.

Connection. Codes under the theme of connection included humility, invested, and informal communication. Participants described that mentors had a willingness to learn about other cultures. Humility was described as a pre-requisite for establishing the relationship in the cross-cultural mentoring dyad:

> I felt like he really wanted to connect and learn more about my culture and my background. So, I feel like if you have somebody with that mindset, it's very easy to

> communicate and be open with each other … and that kind of transcended that minority barrier, that race barrier. (Focus group 1, participant 1)

Faculty and peer mentors were perceived as genuinely interested in mentee success, and this contributed to establishing a trusting relationship and feeling connected to the institution as noted here "It made me feel more connected to the institute in that I had someone to, that offered her time" (Focus group 1, Participant 3). Another participant highlighted, "I feel like I built friendship more that I would have with both mentors, so I really enjoy having that connection with people in school" (Focus group 2, Participant 3).

Participants valued when there were informal modes of communication with mentors, as noted by one participant here: "It is such an easy relationship where I can text her anytime and ask her any question" (Focus group 2, Participant 3). The networking events were also opportunities to interact with faculty in less formal environments:

> I guess one of the key things about having those networking events is that there are a lot of faculty in the room so to me it felt like it was really a situation where students were able to bond more with faculty and see how they are interacting in terms of socializing with their peers and their students, which was an aspect that I hadn't had before. It's not to say that faculty aren't accessible, but it was nice to have that little change there to see them among their peers and to be able to communicate to them in that regard. (Focus group 1, Participant 3)

Participants also described that they would have appreciated additional networking events and more opportunities for less formal interaction with mentors.

Future-oriented. The codes of the final theme include differing foci and paying it forward. Participants noted that the networked mentoring model offered them differing mentor

perspectives. Peer mentors helped them deal with the current stressors of school, and faculty mentors help them think about the future. The differing foci of mentoring sessions is captured here:

> [My peer mentor] was really good about giving me advice on things like clinical placements that are more relevant to me now as a student, and then for my professor mentor ... she was helpful having that, not just focus on the material we're thinking about now but thinking about the career projection. (Focus group 2, Participant 2)

As part of looking to the future, participants hoped to one day serve as peer mentors themselves and to share with mentors what the program had meant to them once campus reopened: "Giving us each a moment to share our experiences in front of everyone involved and give our thanks to what this program has done for us would be a fantastic way to close or wrap things up" (Focus group 1, Participant 3).

Summary. Descriptive statistics on the CEQ scores at baseline revealed lower scores for the intervention group on the university connectedness and environment subscales and slightly higher scores on the university alienation subscale compared with the participant in the comparison group. While participants did not describe feeling alienated at the institution, they described challenges navigating the foreign culture of graduate school and the exosystem/community contexts (Bronfenbrenner, 1994). Additionally, participants noted a shortage of minority role models at the institution, particularly faculty of color.

Over the study period, the intervention group demonstrated increases in scores on the university connectedness and university environment subscales on the CEQ (see Table 5.5). However, intervention group scores remained lower than the student in the comparison group on both subscales. Participants described feeling more connected to the institution through

interactions with peer and faculty mentors in mentoring sessions and networking events and described the importance of having mentors of color. The importance of race in the peer mentoring relationship may indicate that some participants were in the resistance and immersion phases of the racial/cultural identity development model (R/CID; Sue & Sue, 2012). In both phases of the R/CID, the minority student feels increased respect for minority values and rejects the dominant culture. However, participants also expressed valuing a mentor who had successfully navigated through their first year of the program. Bandura (1986) highlights the importance of role modeling for the development of complex skills. Time to master new behaviors can be abbreviated through observing role models, as protégés learn to navigate novel situations rather than relying on trial and error (Bandura, 1986).

Networking events also introduced mentees to graduates of the institution who had persevered and reinforced positive feelings about the institution. The focus on peers and alumni who had persisted highlights minority students' aspiration capital. Aspirational capital encompasses persons of color ability to maintain their positive expectations for the future despite being faced with actual and perceived barriers to success (Yosso, 2005). Participants expressed wanting to participate in more networking events. This study examined the molecular components of the networked mentoring model and it was apparent that participants valued informal networking events with faculty and peer mentors. The next section will address the faculty experience in the networked mentoring model and answer research question four.

Cross-Cultural Psychological Capital

The third outcome research question (RQ4) focused on how participation in a networked mentoring model contributed to DPT faculty's cross-cultural psychological capital. Cross-cultural psychological capital includes four dimensions of the psychological resources needed to

succeed in cross-cultural interactions: (a) self-efficacy, (b) hope, (c) optimism, and (d) resilience (Reichard et al., 2014). The Cross-Cultural PsyCap Scale (Cross-Cultural PsyCap; Dollwet & Reichard, 2014) measures positive psychological capital and the four psychological resources.

Faculty in the intervention and comparison groups completed the Cross-Cultural PsyCap scale in September 2019 (T1) and April 2020 (T2). Faculty in the intervention group completed the Cross-Cultural PsyCap before completing online professional development. Table 5.6 outlines intervention and comparison group performance on the Cross-Cultural PsyCap survey. At T1, the mean item score for the comparison group was 3.73 and the mean item score for the intervention group was 3.29. At T2, the comparison group mean item score was 3.87 and the intervention group mean item score was 3.73. In a study measuring changes in cross-cultural psychological capital pre and post psychological resource training, Reichard et al. (2014) found that participants scored 3.63 pre-intervention, 3.93 immediately post-intervention, and 3.85 one month after the intervention.

In this study, the intervention group scored lower on the Cross-Cultural PsyCap than the comparison group at baseline (T1) and the end of the study period (T2). Participants in the intervention group scored lower than the comparison group on all four dimensions: hope, self-efficacy, optimism, and resilience. At the end of the study period (T2), both the intervention and comparison group scored higher than baseline on the Cross-Cultural PsyCap and demonstrated increased scores on all subscales at T2. The intervention group again scored a lower composite score than the comparison group but higher on the cross-cultural hope dimension at T2.

Table 5.6

Faculty Performance on Cross-Cultural Psychological Capital Subscales

CC PsyCap Composite Score and Subscales	T1 Mean (SD)	T2 Mean (SD)	p-value
Intervention group (n=6)			
CC PsyCap composite score	65.83 (6.24)	74.5 (5.24)	0.046*
Cross-cultural hope	12.0 (1.90)	14.83 (1.94)	
Cross-cultural self-efficacy	28.33(4.68)	33.17 (2.14)	
Cross-cultural optimism	15.0 (1.67)	16.0 (2.61)	
Cross-cultural resilience	10.5 (1.38)	10.5 (1.05)	
Comparison group (n=6)			
CC PsyCap composite score	74.60 (7.16)	77.4 (4.28)	0.854
Cross-cultural hope	13.50 (1.87)	14.17 (2.79)	
Cross-cultural self-efficacy	33.67 (5.16)	35.4 (2.19)	
Cross-cultural optimism	15.2 (1.48)	16.17 (0.98)	
Cross-cultural resilience	11.67 (0.82)	12.0 (0.0)	

Note: T1 denotes "Time 1" pre-intervention, and T2 denotes "Time 2" post-intervention.
*indicates a statistically significant finding with $p<0.05$.

Due to the non-normal distribution of data, the researcher tested the null median of difference between the pre- and post-test scores using the Wilcoxon signed-rank test. The intervention group score increased from 65.83 (composite score at T1) to 74.5 (composite score at T2) with a statistically significant change in pre- and post-test scores ($p=0.046$). The comparison group also increased from 74.5 (composite score at T1) to 77.4 (composite score at T2), with no significant difference between the comparison group pre- and post-test scores ($p=0.854$).

Focus group interviews. Lower intervention group Cross-Cultural PysCap scores at T1 and T2 may suggest that faculty self-selected into the intervention group based on lower self-efficacy of cross-cultural skills. Faculty mentors shared their perception of their cross-cultural skills during the focus group interview. The researcher conducted one virtual focus group

interview with the six faculty in the intervention group in April 2020. The interview was audio-recorded and transcribed. The researcher checked the transcription for accuracy and completed the six-step process for thematic analysis identified by Braun and Clarke (2006). Three themes that emerged from thematic analysis included: nurturing the relationship, vulnerability, and opportunity to learn. The codebook can be found in Appendix NN.

Nurturing the relationship. Codes under nurturing the relationship included investing time, groundwork, shared experience, and value. Faculty mentors described the time commitment associated with effective mentoring. Faculty felt that the multiple touchpoints throughout the study period contributed to developing a more meaningful relationship over a shorter period. Here a participant contrasts mentoring and traditional advising:

> The frequency actually really was helpful in developing the mentor/mentee relationship. I feel like moving forward that would be a good way to really foster this relationship, to help students open up with faculty, which doesn't always happen in an advisee/advisor relationship because we meet every semester and that's not enough touchpoints to reach a relationship. (Focus group 3, Participant 2)

Another faculty mentor discussed the importance of having the time to discuss topics around culture and ethnicity:

> Having the increased time to meet, I think, got us to be able to get to the point of being able to discuss things around culture and ethnicity and understanding … because she wasn't an open book, it would trickle out over time. (Focus group 3, Participant 4)

Conversations during mentoring sessions would become so in-depth that faculty reported losing track of time, as highlighted by one faculty mentor: "I think our Zoom meeting went for an hour and twenty minutes. We didn't even realize how long it went" (Focus group 3,

Participant 3). However, the time investment was a cost of mentoring highlighted by faculty, and mentors were unsure how sustainable this model would be with a larger group of mentees. Despite the time commitment and scheduling challenges, ultimately, the benefits of developing strong, meaningful relationships outweighed the cost, and faculty mentors expressed a willingness to continue the mentoring relationship after the study period. Additionally, mentors strategized how, using technology and meeting with mentees and peer mentors together, frequency could be sustained. One participant expressed: "Now in the days of Zooming or noticing the grouping individuals with their peer mentors was somewhat helpful, there might be ways around that, the increased workload and still getting the benefit" (Focus group 3, Participant 4).

To nurture the mentoring relationship, faculty mentors described intentional decision-making about physical meeting spaces, non-verbal communication, preparation, and discussion topics. Here a mentor describes the physical space as contributing to transitioning from advisor to mentor:

> We stopped meeting in my office and started meeting in other places. We went over to [the cafeteria] and had lunch on two occasions. I think the less formal environment worked to our advantage - to have it be less advisor/advisee or mentor/mentee and more collegial. (Focus group 3, Participant 5)

When meeting in faculty spaces was necessary, mentors made strategic decisions about potential distractions and room set-up, noting that these decisions contributed to mentee comfort:

> I don't have a computer in front of me. I don't have an electronic [device]. I might have my phone, but I purposely push it off to the side. I did notice our environment made a different type of conversation happen. So, when there was a table between us and we

were face to face, his posturing and his ability to relax was, he was much more comfortable. (Focus group 3, Participant 1)

Ultimately, investing time and creating a foundation for the mentoring relationship resulted in mentees seeking out mentors during times of crisis:

> Had we not had those prior meetings, then he probably wouldn't have reached out to me at all, but because we had had those meetings and had done some groundwork. It was interesting because to me it didn't seem like he valued it all that much, but then when it came to this crisis, and he needed someone to speak to, then I felt like he really valued our relationship. (Focus group 3, Participant 6)

Discussing shared experiences, such as belonging to minority or marginalized groups, and having difficult conversations around race, also contributed to nurturing the relationship as captured here:

> The conversation around race actually helped us connect better or bond on a personal level because my advisee is not a big talker, and neither am I. The first two conversations actually felt very forced, but then as she opened up and talked about her racial background, I could relate to that, being a minority person myself, and that actually brought us, that conversation, we bonded in that conversation. I was like, 'Oh, yeah, I've experienced that too.' Those kinds of things helped us connect better. (Focus group 3, Participant 2)

However, not all shared experiences translated to strengthening the relationship, particularly if a mentee did not strongly identify as a minority. Here a faculty mentor talks about belonging to a marginalized group but failing to make a connection with the mentee:

> I see that connection in terms of my minority, being gay, but it was interesting because his perspective on being an ethnic minority. He had never felt much like he was one. He felt lucky in that way, but because that was his perception … I never discussed any sort of examples of how I might have felt biased against. The discussion just didn't really go there. (Focus group 3, Participant 6)

Faculty also described valuing and learning from the mentoring relationships. Here a minority faculty mentor describes the benefit she gained from discussing the shared minority experience with her mentee:

> She talked about some challenges that I feel like I have those challenges also in a normal daily life … I know I was a faculty role, but I actually learned from her how she was dealing with those problems. It was, in fact, a learning curve for me, so I gained from that relationship also. (Focus group 3, Participant 2)

Vulnerability. The next theme, vulnerability, was also seen as vital to establishing and developing the mentoring relationship. Codes included outside the comfort zone, faculty risk-taking, and student-risk taking. Both faculty and students were outside of their comfort zone, talking about potentially sensitive topics such as race, which differed from the traditional advising role. Interestingly, despite receiving recommendations for each mentoring interaction, mentors perceived traditional advising as being more scripted than mentoring, as captured by one mentor here:

> I also thought that I could be a little more vulnerable in the mentee conversations; a little personal, I think, is the word somebody else used. It felt a little bit different than the faculty advising role where again it's a little bit more scripted. (Focus group 3, Participant 4)

Faculty mentors described steps that they took to allow students to share their experiences as minority students at a predominantly White institution. One faculty mentor described taking "a big leap" and discussing the racial incongruence of the mentoring dyad during the first mentor meeting and the pay-off in later sessions:

> He jokes around now. He has a little sarcastic behavior, which I never would have thought. I just see more of his personality, and I think, I don't know if my approach to getting to know him was what created that, or if it just became more comfortable, but I took a leap in the first session right away and asked him. I probably would not do that with an advisee, but this program certainly gave me a reason to jump and ask that question. (Focus group 3, Participant 1)

Additionally, including the peer mentor in the mentee meetings helped mentees and faculty feel comfortable with having challenging conversations:

> The sessions where I brought them in together, I thought that was really added to the fit. Because I think sometimes, they had gotten to a more personal, deeper level too, and that added to the ability to open up about conversations that were maybe more challenging. (Focus group 3, Participant 4)

While faculty and students were taking risks in mentor meetings, mentors also noted a change in mentees and peer mentors in the classroom, who, throughout the study, became empowered. Mentees and peer mentors took risks to talk about their experience as minorities in the classroom as highlighted here: "The individuals who are part of the program, I think it's somewhat empowering for them to feel that they can talk about their race and ethnicity in the classroom" (Focus group 3, Participant 4).

Opportunity to learn. The last theme, opportunity to learn, included codes: individualized learning experience, barriers to intake, and cross-cultural awareness. Through meeting with mentees and peer mentors, faculty began to appreciate the unique educational experience of REM students. Faculty gained an awareness of first-generation students who may lack mentorship and opportunity, students with competing priorities and responsibilities at home, and socio-economic differences:

> There is this socio-economic divide within our classroom of people who wake up in a really high-priced Charlestown apartment and walk seven minutes to class versus someone who might sit on the train an hour and a half and then walk fifteen minutes … to get to class. I didn't have that awareness prior to this experience and just starting to see some of those differences has been really positive for me in how I approach my role as a teacher. (Focus group 3, Participant 5)

Faculty also began to appreciate how the individualized learning experience and being a minority may serve as barrier to intake in the classroom. Faculty began to challenge their assumptions about student readiness to learn as described here:

> It's not just us speaking to students. It's acknowledging their different learning behaviors and learning about what else they have to go through to be able to sit in that chair and receive the education. I think this program really opened my eyes to - he doesn't just get on the bus and get himself into the chair … and he's ready to listen. He went through specific events that happened to him on his way here and just throughout daily life that were really eye-opening. So, maybe I had some assumptions before this program that every student gets there, and they're sitting, and they're ready to learn. (Focus group 3, Participant 1)

Finally, talking about race, cultural differences with mentees and peer mentors, and sharing experiences highlighted faculty awareness of their privilege, as noted in this excerpt:

> I think I was aware that students have different experiences in the classroom … but I think this elevated it even more, to knowing the challenges many students are facing, that certainly with my privileged upbringing, I did not have to deal with. (Focus group 3, Participant 4)

However, the increased awareness of cultural differences did not necessarily translate to increased cross-cultural self-efficacy as captured in this quote "I think I'm so much more aware, and very hypervigilant of not making assumptions which I think makes me less confident" (Focus group 3. Participant 3) and by another faculty mentor: "Having a greater awareness has me being a little more careful" (Focus group 3, Participant 5).

Cross-cultural Capital Summary. Analysis of quantitative data revealed that faculty in the intervention group presented with lower cross-cultural psychological capital than peers in the comparison group at baseline. It is possible that faculty self-selected into this study based on a lower perceived cross-cultural knowledge and skills. However, faculty who participated in the intervention demonstrated a significant increase in their cross-cultural psychological capital at the end of the study period, while there was no significant change in comparison group scores. Yoder (1996) details five different patterns that educators demonstrate when responding to ethnically diverse students: (a) generic, (b) mainstreaming, (c) culturally non-tolerant, (d) struggling pattern, and finally (e) bridging. In the struggling pattern, educators of diverse students move from a lower to higher level of cultural awareness and responsiveness and must experiment with new culturally responsive pedagogical approaches and techniques. In the bridging stage, educators demonstrate a high cultural awareness and leverage culturally adaptive

instructional responses. In this final stage, the educator values diversity, respects cultural differences, and encourages students to maintain their cultural identity. Educators instead help to bridge the gap between the student world and the White culture of the profession (Yoder, 1996). Faculty in the intervention group appeared to be navigating between a struggling and bridging pattern, with increased awareness of cultural differences and challenges adapting teaching styles to students with cultural differences.

Analysis of qualitative data revealed that faculty mentors leveraged specific steps to nurture the mentoring relationship, including dedicating enough time for mentoring, considering physical spaces, non-verbal communication, and preparation. Vulnerability was also seen as a pre-requisite to a successful mentoring relationship and set mentors up for increasing their cross-cultural awareness. Responsiveness was also noted as valuable to establishing the relationship like findings of a study analyzing key mentoring practices to support ethnic-minority pre-doctoral students (Chan, 2008). Chan (2008) found that mentees valued timely communication from mentors, which reinforced trustworthiness and accessibility and encouraged questions from mentees.

Ultimately, faculty mentors in this study gained increased awareness of the unique barriers facing minority students, that may also serve as barriers to intake in the classroom. Gee (2008) highlights that educators tend to hold the assumption that learners can absorb classroom information if they are willing to do so without taking into the account the learner's experience. However, approaching the end of the study period, faculty mentors in the intervention group described an appreciation for the individualized learning experience and an appreciation for their privilege.

Mentoring Needs of Minority Students

The fourth outcome research question (RQ5) investigated how peer mentors guided faculty mentors to meet the unique mentoring needs of first-year REM DPT students. At the mid and end study points, peer mentors completed a survey with both close and open-ended questions (see Table 5.7).

Table 5.7

Peer Mentor Activities and Findings

Critical elements	Average	Ideal	Acceptable
Peer mentoring			
Fall 2019	2.63	4	2
Spring 2020	4.38	6	3
Faculty mentor meetings			
Fall 2019	1	2	
Spring 2020	1	3	
Peer mentors who attended networking events			
Fall 2019	6 (100%)	6	
Spring 2020	5 (62.5%)	8	
Confidence in peer mentoring (average)			
September 2019			
Before online mentor training (n=8)	3.38		
After online mentor training (n=3)	3.67		
December 2019 (n=8)	3.38		
April 2020 (n=8)	3.75		

Note: Responses to confidence in peer mentoring ranged from (4) *Strongly agree* to (1) *Strongly disagree*

At the beginning of the study period, peer mentors scored an average of 3.38 on the four-point scale which explored confidence with mentoring. After the online professional development, the average score for confidence in peer mentoring did increase to 3.67. By the end

of the study period, peer mentors scored an average of 3.75 mainly agreeing or strongly agreeing with the statement, “I feel confident in my ability to serve as a peer mentor.”

When asked how peer mentors guided their mentee’s faculty mentor to appreciate the unique needs of racial and ethnic minority students, peer mentors described sharing their challenges as minority students in a predominantly White institution. One peer mentor elaborated, “I also opened up to her about what we minorities deal with in the classroom and outside the classroom; essentially being looked upon differently and being judged” (Mid-study peer mentor survey, narrative comments). Mentors also shared their self-perceived barriers and facilitators to success to help faculty conceptualize what might be most helpful to minority students as captured here “Explaining my personal story and some of the challenges I've faced. Within the conversation, expressing what has worked to help me continue through the program and what would be helpful from a professor” (Mid-study peer mentor survey, narrative comments). One peer mentor described encouraging the faculty mentor to have difficult conversations around race and be proactive about mentoring strategies captured in this excerpt:

> Keeping open and honest conversations about topics that are not usually brought to light in regard to this topic. Being more proactive instead of reactive to addressing these unique needs is also key. The better connected I feel to the faculty adviser and the sincerity I get from them in being concerned about these needs, makes me more inclined to come to them more about these needs. (Mid-study peer mentor survey, narrative comments)

Six mentors responded that they did not have challenges advocating for their mentee, and one mentor described residing in a “triangle of trust” in the networked mentoring model. Two mentors responded in the affirmative that they found advocacy challenging. When asked to

elaborate, one mentor described their mentee as somewhat guarded and found that as the mentee share more information, the mentor gained an appreciation for the mentee's needs. A second mentor described difficulty because they could not think of resources their mentee did not already have access to. The mentor elaborates:

> [The institution] already provides plenty of resources for students regarding academic support and clubs for minority students, so it was difficult to come up with something that I felt was a unique need of minority students, that wasn't already available. The only thing that I could think of that I felt would be beneficial was if there were more minority faculty that we minority students can better relate to, but that is not in our control. (Mid-study peer mentor survey, narrative comments)

By the end of the study period, none of the peer mentors described finding it challenging to advocate for their mentees. The change was noted by one peer mentor here "I felt that initially, it would have been the most challenging, but as we got to know each other better, it was easier to advocate for her" (End of study peer mentor survey, narrative comments).

Socialization into the Physical Therapy Profession

The fifth outcome research question (RQ6) investigated how participation in a networked mentoring program contributed to second-year REM DPT students' socialization into the physical therapy profession. The researcher conducted two virtual focus group interviews with peer mentors nearing the end of the study period in April 2020. Each focus group included four peer mentors. Interviews were audio-recorded, transcribed, checked for accuracy, and subjected to thematic analysis. Three themes emerged from focus group interviews: community, upward trajectory, and empowered. The codebook can be found in Appendix OO.

Community. Codes under community included the cohort model, faculty support, and belonging. Peer mentors felt that in their cohort of peers, described as cohesive, they had a community on whom they could depend. One mentor said, "The cohesiveness of our cohort - I felt like there's always been a collaborative environment. I've never been competing with my classmates. So just those two aspects are some of the highlights of the positive experience I've had" (Focus group 5, Participant 3). However, another mentor highlighted the work that goes into establishing a supportive environment "I created the community of people I can depend on, whether it's work or personal things" (Focus group 4, Participant 1).

Relationships with faculty also contributed to a sense of community, as articulated by one participant here: "I've had great interactions with all the professors. It's been really easy to access them" (Focus group 4, participant 2). However, not all faculty were perceived as equally supportive, with some being more accessible than others, as captured here: "I think accessibility in terms of being approachable and being receptive, I wouldn't say that it's the same across all the faculty members and it might just be a personality thing" (Focus group 5, Participant 2). Despite differing levels of faculty approachability, a peer mentor described the importance of seeking help from faculty and how that contributed to their success:

> When I was in high school, I was told I would never go to a four-year [college]. I mean, I agree with the professors why they said it because I was a bad kid, doing bad stuff, not following directions … but I obviously got it together. So, it's impactful to see how far I made it, and it goes to show with the help of professors and making an effort to go see professors. (Focus group 5, Participant 4)

Finally, the sense of community and belonging was also strengthened through involvement in the mentorship program as highlighted by one peer mentor here:

> I feel like it was very positive for me to feel part of the community and have that network of students and faculty members that are trying to understand, So I feel like it was a positive experience for me to be able to help someone who might also be going through the same thing. I just feel like for me it was like I'm not the only one going through that. (Focus group 5, Participant 1)

Upward trajectory. Codes under upward trajectory included professional growth and room to grow. Peer mentors described their learning experiences in the classroom and clinical environment as well as through the networked mentoring program. Mentors described the joy of seeing their mentees grow professionally as well. Here are participant describes their time in the graduate program "The amount that I've learned in such a short period of my time has been crazy. I didn't think it was possible how much you can learn" (Focus group 4, Participant 2). Another peer mentor describes feeling prepared for their career "I feel prepared to be a well-rounded clinician, which is what going to school for, so I feel like I'm coming out with the education I have been expecting. It's been a good experience overall" (Focus group 4, Participant 4). Here a peer mentor talks about exceeding expectations attributed to a strong support network:

> When I first started, I felt like there's no way I'm going to be a doctor. No way. I'll probably be working at a restaurant or something. It just goes to show with mentorship and support, and I guess a support system, anything is possible. (Focus group 5, Participant 4)

When summarizing their time at the institution, one peer mentor described a steady growth:

> I've been reading books about stock markets and volatility and how you have all these ups and downs of things. Maybe that's not relevant right now, but when I look at my time over at [this institution], I feel like it's been waves of ups and downs, but it's been a

consistent trajectory of progress and learning different things. (Focus group 4, Participant 1)

Participants agreed that the institution had made progress during their time of study but described the institution as having the potential to improve, particularly in the domains of representation and cultural competence. Peer mentors described feeling represented in the classroom with more racial and ethnic diversity than in previous cohorts, which contributed to a sense of belonging. While mentors noted a strong representation of female leaders, mentors also noted a lack of representation of faculty of color, both core and associated faculty (laboratory instructors). One peer mentor summarizes:

> I think that our program has a long way to go in terms of creating more opportunities to see successful, accomplished clinicians of color in our classroom because I think innately it just, there is something about it that it just, it may not always be something you can express verbally, but it just affirms that this path you're on, what you're trying to accomplish is possible when you see people who look like you have already accomplished it. (Focus group 5, Participant 2)

Mentors highlighted the value of diverse faculty who could help them achieve goals of effecting change in communities of color as highlighted by one mentor here: "I think those dips in the line come through with short-comings I didn't feel as far as finding things that were particular to the community I want to work with" (Focus group 4, Participant 1). Another mentor highlighted the need for diversity of thought and more attention to health disparities:

> I think there can be a lot more education and effort put into providing a diversity of opinions, or patients, speaking more on equity in healthcare and resources. I think that

could be a lot more intentional and I think it's definitely glossed over. (Focus group 5, Participant 2)

Empowered. Codes under empowered included leveling the playing field, power dynamic, reciprocity, and confidence. Mentors became aware that through mentorship they helped to level the playing field for first-year mentees, captured here: "If you have a starting line of people that are further back than others, we help them move a little closer to the starting line, so that's what I hope came out of this" (Focus group 4, Participant 1). Through the act of supporting their first-year mentees, mentor described gaining an appreciation for what their professional careers might look like:

> I think I already understand the importance of reaching back to people who are going through what you've gone through and I understand the importance of being able to advocate for people, but I think this really solidified what that can look like professionally. (Focus group 4, Participant 1)

Mentors felt that the lack of a power differential between peer mentors and mentees contributed to an open and honest relationship and described the need to be fluid when mentoring. Here a peer mentor describes why a first-year mentee might feel more comfortable reaching out to their peer mentor " I feel like they were more comfortable with asking questions and asking questions that … they might feel are dumb questions for faculty members, but they felt comfortable with us because we've been through the same [thing]" (Focus group 5, Participant 1).

Through participation in the networked mentoring program, peer mentors became aware of the bidirectional nature of mentoring. Participant voiced that through conversations with mentees and reflection, their own professional goals and interests were reaffirmed. Participants

also felt that their cultural awareness was enhanced through time spent with mentees, as noted here:

> I wanted to enter our mentorship in this program with the idea that yes, I have things to give, but [my mentee] had so many wonderful things she already experienced in her life, so many cultural things I was able to learn about through her. So, there was definitely that humility that I learned. (Focus group 4, Participant 1)

Mentors left the program with increasing confidence in their ability to mentor as noted here: "I found that being a mentor kind of brought a lot of qualities out of me that I thought I didn't have, that I've been holding back for so long" (Focus group 5, Participant 4). Increasing confidence in mentoring and advocacy also increased mentor's motivation to pursue future mentoring opportunities:

> One thing I found really valuable from this experience was it gave me more confidence to speak to leadership members; in this case, the faculty members. I feel like this will carry on in the clinic setting. If I want to speak up about something, I will feel a little more comfortable … I feel like I would feel more comfortable speaking up and make a positive change in the clinic … I might feel more comfortable taking a student as a physical therapist. (Focus group 5, Participant 1)

While participants expressed no significant change in their motivation to pursue an academic career, they noted an appreciation for the role of faculty in student success:

> Before this program, I felt like a career, an academic career, was pretty much about research and doing your job. I didn't see everything that goes behind the classroom setting. I didn't realize how important the fact that the student has to be comfortable in your classroom makes a difference in learning. I thought it was pretty cool to see how

even if a professor makes the extra effort to meet with the student, how much of a difference that makes. (Focus group 5, Participant 1)

Socialization into the Physical Therapy Profession Summary. Second-year DPT peer mentors described their professional growth during their time as graduate students. Peer and faculty support contributed to a sense of community, highlighting the value of proximal processes in the microsystem that comprise the graduate students' daily interactions (Bronfenbrenner, 1994). Terry and Ghosh (2015) highlight that doctoral students need academic, personal, and professional supports to be successful, emphasizing the need for different types of social support and multiple mentors. While the second-year students served as peer mentors in this study, their need for mentorship was also evident. Peer mentors emphasized the need for proactive mentoring. In an analysis of key mentor practices when mentoring ethnic minority pre-doctoral students, Chan (2008) noted that mentors were also proactive about mentoring and checked in when they had not heard from mentees. Frequent mentor contact was valuable to minority mentees who acknowledged not knowing what the right questions were.

Two forms of community cultural wealth relevant to the peer mentor experience include social capital and navigational capital. Social capital comprises the networks of people REM students rely on to obtain information, access resources, and for emotional support. Navigational capital describes the ability to advance through social institutions not designed with persons of color in mind (Yosso, 2005). It was evident that second-year students actively worked to create a community with peers and faculty and design social networks needed to succeed.

Bronfenbrenner and Morris (2006) emphasize the bidirectional aspect of relationships in the microsystem and the degree of reciprocity in any proximal process in the ecological system. Reciprocity in the mentoring relationship has been highlighted by Chan (2008) and Terrion and

Leonard (2007). Mentoring as a two-way street was highlighted by peer mentors who articulated their professional growth through participating in the networked mentoring model. Mentors felt empowered hearing from minority leaders in networking events, once again highlighting the value of the molecular component: networking events. Additionally, peer mentors grew confident in their ability to mentor others through observing their mentees' professional growth.

Peer mentors described having an enhanced understanding of the faculty role and, while their motivation to pursue an academic career did not change, mentors described planning to seek out future mentoring opportunities. Mentors appreciated that teaching is inherently a part of the physical therapy profession. Here the connection is made to resistant capital, which highlights students of color learning to value themselves and assert themselves because of this awareness (Yosso, 2005). Through participating in the mentoring program, peer mentors appeared to gain confidence as they looked ahead to becoming Doctors of Physical Therapy.

Discussion

Limitations

There are four limitations to this research, including context, the researcher's relationship to the participants, the sample size of the intervention and comparison groups, as well as sample composition.

This research investigated REM DPT students' social isolation and sense of belonging. However, during the last month of the intervention and before data collection, the institution closed its campus due to the COVID-19 pandemic and implemented social distancing measures. Students and faculty switched rapidly to online learning, and mentoring teams transitioned to virtual mentoring. Peer mentors described challenges acclimating to online learning with decreased time to dedicate towards mentoring. Also, campus closure potentially contributed to

the first-year mentees increased social isolation and decreased university connectedness due to a lack of daily contact with faculty and peers. While the value of the intervention is highlighted, the findings of the study may have been altered due to the COVID-19 global pandemic.

The researcher, a faculty member at the institution, served as one of the faculty mentors in the study and the focus group facilitator. Despite strategies to mitigate the power dynamic between the researcher and participants, it is possible that the researcher's relationship with first- and second-year participants altered participants' responses to focus group questions. Strategies to minimize this limitation are presented under implications for future research.

Sample size and composition serve as additional study limitations. A power analysis was conducted a priori to determine the required sample size for this study. Powered at 0.8, with an estimated effect size of 0.5, and with α=.05, the required sample size would have been a total of 26 participants. The researcher hoped to enroll 10 students in the intervention group and twenty students in total in the comparison groups. While the sample of participants in the intervention group included eight first-year REM DPT students, only one student consented to join the comparison group. Sample size ultimately limited statistical analyses, comparisons, and generalizability of results. Financial incentives for participants, as well as larger stipends for peer mentors may improve recruitment, particularly into the first-year comparison group. Finally, participants were recruited from one cohort of students at one institution, further limiting the generalizability of findings. Future researcher involving an interprofessional group of students and faculty from across the institution is discussed next.

Implications for Research

As described, a homogenous and small study sample limited the generalizability of study findings. Recruiting an interprofessional group of students and faculty may help to minimize

limitations and address diversifying other health sciences professions such as occupational therapy, which, like physical therapy, is also dominated by White women (Taff & Blash, 2017). Each health sciences field has worked independently and unsuccessfully to diversify their professions over the last two decades. In 2006, only 3% of genetic counselors self-identified as African-American/Black, Latino/Hispanic, or American Indian/Alaskan Native, with stagnant growth of these groups between 1992 and 2006 (Mittman & Downs, 2008). Complex social problems such as health disparities, which disproportionately impact minority groups, often resist solutions by a single organization (Siegel, 2010) and may instead benefit from an interprofessional and collaborative approach to address the shortage of minority health care providers. For this reason, the next iteration of the networked mentoring model is an interprofessional networked mentoring program including faculty and students from physical therapy, occupational therapy, speech and language pathology, genetics counseling, and nursing.

As described, this study explored the molecular components of a networked mentorship program which included faculty and peer mentoring as well as networking events. Both first-year mentees and second-year peer mentors expressed interest in more networking events and additional opportunities for informal interactions. As part of a peer-mentoring intervention to support freshman college students, Yomtov et al. (2017) included activities where mentoring groups attended events on campus, not part of the mentoring program. Future research should increase the number of networking events and on-campus activities to enhance academic and social integration for first-year REM health sciences students.

The theory of treatment (see Figure 4.1) highlighted that the intervention could lead to improved academic performance (intermediate outcome) and on-time degree completion (long term outcome) for REM DPT students. However, the two-semester long intervention period did

not allow for the investigation of the effect of mentoring on graduation rate and time to degree completion. Future research would benefit from following participants throughout their enrollment at the institution to investigate the long-term outcomes of networked mentoring.

Implications for Practice

Findings from this research study can inform institutional leadership about the benefits of networked mentoring on three groups of stakeholders at the institutional. First-year REM DPT students described feeling more connected to the institution through interactions with peer and faculty mentors in mentoring sessions and networking events. Faculty mentors in the intervention group demonstrated a significant increase in cross-cultural psychological capital, and peer mentors articulated their professional growth through participating in the networked mentoring model. Additionally, peer mentors expressed an interest in seeking additional mentoring opportunities.

While faculty mentors in the study developed an appreciation for the unique needs of REM students in higher education, a consistent theme that emerged from the needs assessment and intervention included the need for more faculty of color. First-year mentees and peer mentors expressed that faculty of color help to role model success. Increasing the number of faculty of color at the institution should remain an institutional priority.

Conclusion

This research investigated the problem of practice, the underrepresentation of racial and ethnic minority faculty in physical therapy higher education in the U.S. The literature review and needs assessment helped to focus this study on the success of REM students enrolled in a Doctor of Physical Therapy program, revealing inequitable outcomes for REM DPT students. This study focused on fostering social and academic integration by providing racially concordant

mentorship for first-year REM DPT students. Consistent with the reciprocity associated with mentorship, gains were made by all members of the networked mentoring team, highlighting the value in this approach. However, the literature review revealed additional primary drivers to REM student success, including the need for a culturally responsive curriculum, mitigating stereotype threat among faculty, staff, and students, and supporting culturally and linguistically diverse learners' mastery of the technical language of the curriculum. Ultimately a paradigm shift and move toward multicultural DPT education is warranted to successfully meet the needs of REM students and transition to a racially and ethnically diverse healthcare workforce.

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Appendix A - Focus Group Interview Recruitment Letter

Study Title: Facilitators and Barriers to Success in a Doctor of Physical Therapy Program

Principal Investigator: Dr. Keshrie Naidoo PT, DPT, MS, OCS
Instructor, MGH Institute of Health Professions

You are being asked to participate in a research study investigating racial and ethnic minority student experience while enrolled in a Doctor of Physical Therapy (DPT) Program. All currently enrolled physical therapy students and 2018 graduates who self-identified as belonging a racial/ethnic minority group when applying to the MGH Institute DPT Program are being asked to participate in a 45-minute focus group interview to share your experiences as a racial/ethnic minority student in a DPT Program.

Each focus group will be comprised of 5-7 students and will be led by the principal investigator, Dr. Keshrie Naidoo. The interview will be audio recorded and transcribed by a staff person. All identifying information will be removed.

Please contact the Principal Investigator, Dr. Keshrie Naidoo PT, DPT, MS, OCS, with any questions you may have: (617) 724-4848.

If you are interested in participating in this focus group, please email Dr. Naidoo (knaidoo@mghihp.edu)

Appendix B - Mentoring Survey Recruitment Letter

Study Title: Facilitators and Barriers to Success in a Doctor of Physical Therapy Program

Principal Investigator: Dr. Keshrie Naidoo PT, DPT, MS, OCS

Instructor, MGH Institute of Health Professions

You are being asked to participate in a research study investigating student experience with mentorship while enrolled in a Doctor of Physical Therapy (DPT) Program. All physical therapy students currently enrolled in the MGH Institute DPT Program along with 2018 graduates of the MGH Institute DPT Program are being asked to complete an online survey which takes approximately 20 minutes to complete.

Please contact the Principal Investigator, Keshrie Naidoo PT, DPT, MS, OCS, with any questions you may have: (617) 724-4848.

By clicking "I agree" below you are indicating that you are at least 18 years old and agree to participate in this research study. By completing this survey or questionnaire, you are consenting to be in this research study. Your participation is voluntary, and you can stop at any time. You will be redirected to the online survey.

I Agree **I Do Not Agree**

Appendix C - Focus Group Oral Consent Form

Informed Consent Form

Title:	Facilitators and barriers to success in a Doctor of Physical Therapy Program
Principal Investigator:	Dr. Yolanda Abel, Johns Hopkins School of Education
Date:	10/12/18

PURPOSE OF RESEARCH STUDY:

The purpose of this research study is to investigate racial and ethnic minority student experience while enrolled in a Doctor of Physical Therapy (DPT) Program. Student perception of barriers and facilitators to academic success can provide valuable insight and inform teaching practice.
We anticipate that approximately ten people will participate in this study.

PROCEDURES:

You are being asked to participate in one focus group interview session that will last no longer than 45 minutes. Each focus group will be comprised of between five to seven students who have self-identified as belonging to a racial/ethnic minority group upon application to the program. The focus group interviews will be led by the student investigator, Dr. Keshrie Naidoo. Dr. Naidoo will start by posing one broad question to the group and will then ask follow-up, clarifying questions to further understand your responses.

RISKS/DISCOMFORTS:

There is risk of discomfort with some of the questions and you may skip any questions you don't wish to answer or end your participation at any time. The risks associated with participation in this study are no greater than those encountered in daily life.

BENEFITS:

There are no direct benefits to you from participating in this study. However, participating in the study will assist in guiding the researcher in making recommendations to improve the educational experience for DPT students.

VOLUNTARY PARTICIPATION AND RIGHT TO WITHDRAW:

Your participation in this study is entirely voluntary: You choose whether to participate. If you decide not to participate, there are no penalties, and you will not lose any benefits to which you would otherwise be entitled. If you choose to participate in the study, you can stop your participation at any time, without any penalty or loss of benefits. If you want to withdraw from the study, please feel free to excuse yourself from the focus group interview.

CONFIDENTIALITY:

We will begin the focus group by asking the participants to agree to the importance of keeping

information discussed in the focus group confidential. In addition, we will ask each participant to verbally agree to keep everything discussed in the room confidential, and will remind them at the end of the group not to discuss the material outside.

The interview will be audio recorded and transcribed by a staff person. All identifying information will be removed. We ask that you do not reveal identifying information about yourself and others in the group. Any study records that identify you will be kept confidential to the extent possible by law. The records from your participation may be reviewed by people responsible for making sure that research is done properly, including members of the Johns Hopkins University Homewood Institutional Review Board and officials from government agencies such as the National Institutes of Health and the Office for Human Research Protections. (All of these people are required to keep your identity confidential.) Otherwise, records that identify you will be available only to people working on the study, unless you give permission for other people to see the records.

We are collecting this data for research purposes only. We will not provide you or anyone else your specific responses. All data will be aggregated (i.e. we will combine your responses with the responses of all other participants). Data will be stored on Partners encrypted computers and behind the Partners firewall.

COMPENSATION:

You will not receive any payment or other compensation for participating in this study.

IF YOU HAVE QUESTIONS OR CONCERNS:

You can ask questions about this research study now or at any time during the study, by talking to the researcher(s) working with you or by calling Keshrie Naidoo at 617-724-4848.

If you have questions about your rights as a research participant or feel that you have not been treated fairly, please call the Homewood Institutional Review Board at Johns Hopkins University at (410) 516-6580 or contact the Partners Human Research Committee at (857) 282-1900.

Appendix D - Mentorship Needs Survey

1. How would you define a mentor?

2. What are some activities and practices you associate with mentoring?

3. In your opinion, what are some differences between an advisor and a mentor?

When answering the following questions, you are encouraged to keep one of your mentors in mind if you currently have more than one mentor.

4. How did this particular mentor become your mentor?

5. What are qualities of your mentor or activities he or she does that makes the relationship a success?

6. How often do you communicate with your mentor?

7. In what ways do you communicate with your mentor? (select all that apply)
   a. Phone
   b. Email
   c. Face to face meetings
   d. Other

8. How has he/she contributed to your academic/professional development?

9. What specifically does your mentor do to encourage or support you?

10. How does your mentor act as a role model for you?

11. In what ways are you different from your mentor? (select all that apply)
    a. Gender
    b. Race
    c. Ethnicity
    d. Culture
    e. Sexual orientation
    f. Other
    g. Not applicable (There are no differences between my mentor and I)

12. Do the differences between you and your mentor affect your relationship?
    a. Yes
    b. Maybe
    c. No

13. If you answered ‘Yes’ or ‘Maybe’ to Question 16, how do these differences affect your relationship?

14. If you answered ‘Yes’ or ‘Maybe’ to Question 16, how were these differences addressed in your relationship?

15. What drawbacks are there to being in a mentoring relationship?

16. How would you sum up the benefits you get from mentoring?

17. Which qualities do you possess or things you do that make the relationship a success?

18. What could your mentor do to improve the relationship even further?

19. Gender
a) Female
b) Male
c) Other
d) Decline to specify

20. Please specify your race and ethnicity
a) African American
b) American Indian/Native Alaskan
c) Asian/Pacific Islander
d) Hispanic
e) White
f) Other
g) Decline to specify

Appendix E - Focus Group Interview Protocol

1. As you reflect on your experience in this physical therapy program, name the one thing that you would say has most facilitated your academic success?
2. Can you name the one thing that has most inhibited your success?
   You have mentioned a number of factors that have facilitated and/or inhibited your success thus far. Let's talk for a moment about how you would define success.
4. What is your definition of success at this point in your career?
5. How do you assess whether or not you have been successful?
6. How would you describe someone who is/has been successful?
7. What will define success in the next 5 to 10 years in your career?
8. How would you describe someone who is/has been successful?
9. Based on the definitions of success generated by the group—what types of things have or might in future inhibit your success or make achieving success more difficult?
10. What kinds of challenges have you faced getting to this point in the physical therapy program? Challenges with classes? Challenges with peers? Financial challenges?
11. How would you describe the racial climate during your physical therapy educational experience?
12. What kinds of interactions do you have with your faculty?
13. What kinds of interactions do you have with your peers?
14. Are there any personal attributes that have made it challenging for you?
15. Based on the definitions of success, what types of support systems and opportunities have facilitated your success or make achieving success easier?
16. What has enabled you to be successful in the past (i.e., as a student) and to overcome any obstacles in your path?
17. What things are available to you now—or should be available to you now—to help you achieve success in the future?

Appendix F - Codebook Utilized to Analyze Focus Group Data

Theme	Code	Description
Balance	Family	Family life was a priority for those students with children and those without a family were factoring this into future plans.
	Work	Students viewed a full-time job as a success for some this included business ownership in the future
	Self-care/spirituality	Self-care in many forms was a priority both while enrolled in PT school and afterwards. Spirituality, meditation, fostered the ability to focus and control stress levels
	Personal and professional goals	Students were committed to lifelong learning and continued professional development
Stability	Full time employment	Full time employment was viewed as a success to meet basic needs (food and loan repayment), as well as care for family.
	Financial security	Students also expressed the need financial stability in order to serve
	Focused career path	Conscious of having divided attention or competing interests, looking ahead to committing to one aspect of PT. For some this included pursuing specialization.
Service	Community	Health and wellness promotion in minority communities was a priority, increasing access to those facing financial and language barriers.
	Increasing access	Students planning to use bilingual status to increase access for non-English speaking minority patients
	Minority students	Students viewed serving as role models and mentors for others in their communities as a priority
	Profession	Students planned to give back to the profession by upholding legal and ethical standards, improving clinical care, and serving as mentors to students
Authenticity	Relationship with minority peers	The shared minority experience allowed students to have open and honest relationships with other minority students which were described as safe and joyful.
	Relationships with faculty	Faculty were seen as kind, enthusiastic and committed to students' success. Faculty were generous with knowledge and time and respectful of cultural differences.

Theme	Code	Description
	Clinical education	Students valued hands on experience in the clinical environment. Real-life situations and patient interactions helped to build student confidence
	Application	Students defined success by being able to apply content in the clinical environment rather than scoring well on a test.
	Collaboration	Valued working in small groups with peers as a means of training to be effective in healthcare teams. Valued diverse perspectives. Increased comfort in small groups.
Mentorship	Role models	Parents were seen as role models, serving the community, strong work ethic, humble beginnings.
	Mentorship programs	Mentoring programs helped provide students with access to support writing essays, attending interviews.
Discrimination	Racism	Outright incidences of racism were rare but reported
	Stereotyping	Discriminated based on an accent or ethnicity. Accomplishments devalued and attributed to race/ethnicity
	Microaggressions	Denigrating messages to students of color. Isolated incidences from associated faculty and clinical faculty. Frequent exchanges from peers.
	Segregation	Self-imposed social isolation with minority peers
Language	Bilingual status	Students who spoke ESL reported needed more time to process and understand materials but felt that bilingual status would benefit minority patients in the future
	Technical language of the curriculum	Even those with English as a first language struggled with the technical language in the curriculum. Communication with patients in non-complex terms could be a strength.
Lack of representation	Academic setting	Core and associated faculty in the classroom
	Clinical setting	Clinical faculty and instructors in the clinical setting
	Peers	Lacking racial and ethnic diversity in the classroom among peers

Appendix G - Mid and End of Program Survey – First-Year REM DPT Students

Participant ID #: _____

1. How many advising sessions did you attend with your faculty advisor this semester? (select from dropdown menu)
    a) 0
    b) 1
    c) 2
    d) 3
    e) 4
    f) 5
    g) 6
    h) Other

2. How many mentoring sessions with your peer mentor did you attend this semester? (select from dropdown menu)
    a) 0
    b) 1
    c) 2
    d) 3
    e) 4
    f) 5
    g) 6
    h) Other

3. How many networking events did you attend this semester? (select from dropdown menu)
    a) 0
    b) 1
    c) 2

Use the 5-point scale, ranging from 1 = “strongly disagree” to 5 = “strongly agree,” to indicate your agreement level for each of the statements below.

4. My faculty advisor provides adequate time for quality mentoring

5. My faculty advisor communicates between meetings

6. My faculty advisor mirrors a professional image

7. My faculty advisor conveys a passion for the profession

8. My faculty advisor reviews the following areas during our advising sessions (select all that apply)
    a) Coursework
    b) Clinical education experiences
    c) Professional development
    d) My challenges thus far in the program
    e) My successes thus far in the program
    f) My concerns

9. What could your faculty advisor do to improve the relationship even further?

10. Which qualities do you possess or things you do that make the relationship with your faculty advisor a success?

11. What could your peer mentor do to improve the relationship even further?

12. What has been your most positive experience in the mentorship program thus far?

13. What is the greatest strength of this program?

14. What suggestions do you have to make the mentorship program more effective and beneficial for student participants?

15. Additional comments (optional)

Appendix H - Comparison Group Mid- and End of Study Mentoring Survey

Participant's ID #: _____

1. How many advising sessions did you attend with your faculty advisor this semester? (select from dropdown menu)
    a) 0
    b) 1
    c) 2
    d) Other

2. How many meetings with your peer buddy did you have this semester? (select from dropdown menu)
    a) 0
    b) 1
    c) 2
    d) Other

Use the 5-point scale, ranging from 1 = "strongly disagree" to 5 = "strongly agree," to indicate your agreement level for each of the statements below.

3. My faculty advisor provides adequate time for quality mentoring

4. My faculty advisor communicates between meetings

5. My faculty advisor mirrors a professional image

6. My faculty advisor conveys a passion for the profession

7. My faculty advisor reviews the following areas during our advising sessions (select all that apply)
    a) Coursework
    b) Clinical education experiences
    c) Professional development
    d) My challenges thus far in the program
    e) My successes thus far in the program
    f) My concerns

8. Please include any comments you want to share about your interactions with your *peer buddy*.

Appendix I - Second-Year Peer Mentor - Mid and End of Program Survey

Participant ID # _____

1. How many mentoring sessions did you attend with your mentee this semester? (select from dropdown menu)
    a) 0
    b) 1
    c) 2
    d) 3
    e) 4
    f) 5
    g) 6
    h) Other

2. How many meetings with your mentee's faculty advisor did you attend this semester? (select from dropdown menu)
    a) 0
    b) 1
    c) 2
    d) 3
    e) Other

3. How many networking events did you attend this semester? (select from dropdown menu)
    a) 0
    b) 1
    c) 2

4. How do you guide your mentee's faculty advisor to appreciate the unique needs of racial and ethnic minority students?

5. Do you find it challenging to advocate for your mentee?

6. If so, how and why?

7. Please rate your level of agreement with this statement: I feel confident in my ability to serve as a peer mentor
    a) A – Strongly agree
    b) B – Mainly agree
    c) C – Mainly disagree
    d) D – Strongly disagree

8. What has contributed to your confidence in serving as a peer mentor in this program?

9. What suggestions do you have to make the mentorship program more effective and beneficial for participants?

10. Additional comments (optional)

Appendix J - College Experience Questionnaire

Participant's ID #: _____

Use the 5-point scale, ranging from 1 = "strongly disagree" to 5 = "strongly agree," to indicate your agreement level for each of the statements below.

1. I feel fully entitled to all of the resources available on campus. (**C)**

2. I don't regret my decision to attend this institution. (**E)**

3. This institution is consistent with my academic expectations. (**C)**

4. I feel socially alienated at this institution. (**A)**

5. I believe this institution admitted me based on academic credentials not race or other characteristics. (**E)**

6. I feel racially isolated here. (**A)**

7. This institution provides me with the necessary social outlets. (**E)**

8. I believe that there are enough resources on campus to help deal with any racial or cultural issue a student may have. (**E)**

9. This institution is teaching me what is necessary to be successful. (**C)**

10. There are sufficient minority faculty and staff to serve as resources for students. (**E)**

11. I would recommend this institution to perspective students. (**E)**

12. I am very likely to participate in the Alumni Association after I graduate. (**E)**

13. I represent the kind of student the institution is proud to have as part of its student body. (**C)**

14. Sometimes things on campus make me feel inadequate interpersonally. (**C)**

15. When, or if, I feel academically inadequate, it has nothing to do with race. (**A)**

16. My racial group is sufficiently represented in classes. (**C)**

17. The University Administration responds to the diversity that I represent. (**E)**

18. In general, the faculty treat me the same as they treat other students. (**E)**

19. I feel comfortable expressing my opinion even if it is a minority perspective. (**A)**

20. I do not feel like a marginalized member of the campus community. (**A)**

21. Primarily, I attend multicultural events on campus. (**C)**

Note. Subscales: E = University Environment; C = University Connectedness; A = University Alienation.

Appendix K - Faculty Cross-Cultural Psychological Capital Survey

Participant's ID #: _____

Use the 5-point scale, ranging from 1 = "strongly disagree" to 5 = "strongly agree," to indicate your agreement level for each of the statements below.

1. At the present time, I am energetically pursuing my goals related to working with individuals from different cultures than me
2. At this time, I am meeting most of the goals that I set for myself when interacting with individuals from different cultures
3. I can think of many ways to reach my goals when interacting with individuals from different cultures
4. There are lots of ways around any problem that I face when interacting with individuals from different cultures
5. I feel confident when interacting with individuals from different cultures
6. I believe I can succeed at almost anything I set my mind to when working across cultures
7. I feel confident in analyzing cross-cultural problems to find a solution
8. I feel confident in contributing to discussions about global issues when interacting with individuals from different cultures
9. I am confident that I can work effectively with individuals from many different cultures
10. I am confident that I can perform effectively on many different tasks when working with individuals from different cultures
11. I believe I can succeed at most any endeavor to which I set my mind even when working with individuals from different cultures
12. I am able to learn about new cultures very quickly
13. I feel confident analyzing an unfamiliar culture to understand how I should behave
14. When facing difficulties in cross-cultural interactions, I usually expect the best
15. I am optimistic about my future cross-cultural interactions
16. I always look on the bright side of things regarding cross-cultural interactions
17. I approach interacting with individuals from different cultures as if 'every cloud has a silver lining'
18. Even when things are tough, I can *perform* quite well when working with individuals from different cultures
19. Even when things are tough, I can *interact* quite well with people from different cultures
20. When I interact with individuals from a different culture, I am able to successfully overcome many challenges

Appendix L - Data Accounting Log

Data	Participant 1	Comparison 1	Peer mentor 1	Faculty 1
CEQ pre	09/19	09/19	--	--
Participant survey – midway	12/19	--	--	--
Comparison group survey - midway		12/19		
Peer mentor survey - midway			12/19	
Participant survey – final	04/20	--	--	--
Comparison group survey - final		04/20		
Peer mentor survey – final			04/20	
CEQ post	04/20	04/20	--	--
Focus group interview	04/20	--	04/20	04/20

Appendix M - Interview Protocol for First-Year REM DPT Students (Mentees)

1. Please tell me a little information about yourself.
2. What are your goals and aspirations?
3. What has your experience at this institution been like? How has the intervention shaped feelings of connectedness or alienation within the university community?
4. Did this mentoring program enhance your educational and social experience as a first year DPT student? If so, how?
5. In what ways do you feel that the mentoring program facilitates first-year graduate students' successful transition to graduate school?
6. What is the greatest strength of this program?
7. What has been your most positive experience in the mentoring program?
8. What was your favorite program activity provided by the mentorship program?
9. What components of the program were more effective than others?
10. What are the challenges of being in a mentoring relationship?
11. What suggestions do you have to make the mentorship program more effective and beneficial for faculty, peer mentors and mentees?
12. Is there anything else that you would like to mention about your experience in the mentorship program that I haven't already covered?

Appendix N - Interview Protocol for Peer Mentors

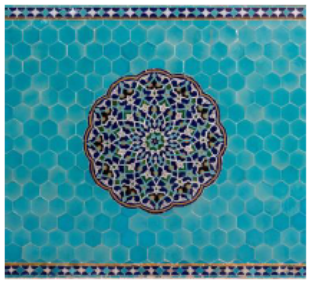
1. Please tell me about your goals and aspirations.
2. What has your experience at this institution been like?
3. How do you feel connected within the institute community? Alienated?
4. How would you describe your role as a peer mentor?
5. How did the mentoring program enhance the educational and social experience of first-year DPT students?
6. How has the mentoring program facilitated first-year DPT students' successful transition to graduate school?
7. How did you increase faculty awareness of the unique mentoring needs of racial/ethnic minority students?
8. Can you tell me about a time when there was a barrier to advocating for your mentee's needs and how you overcame this barrier?
9. What was your perception of an academic career before serving as a peer mentor? Has your perception changed after serving as a peer mentor? If so, how?
10. Socialization involves the process by which individuals gain the knowledge, skills, and values necessary for successful entry into a professional career.
    How has your involvement in this program influenced your socialization into the physical therapy profession?
11. What was your favorite program activity provided by the mentorship program?
12. What is the greatest strength of this program?
13. What has been your most positive experience in the mentorship program?
14. What are some costs of mentoring to you? (e.g., use of time and resources)
15. What suggestions do you have to make the mentorship program more effective and beneficial for faculty, peer mentors and mentees?
16. Is there anything else that you would like to mention about being a peer mentor that I haven't already covered?

Appendix O - Semi-Structured Focus Group Interview Protocol for Faculty Mentors

1. How would you describe your role as faculty advisor?
2. What types of issues are harder to deal with than others in advising? How would you describe a time when it was particularly difficult to advise somebody?
3. What is the role of race and ethnicity in your advising?
4. When your race/ethnicity is different from your advisee—what types of things do you have to address when fostering relationships? How do you address challenges that may arise due to race/ethnicity differences?
5. What are the most effective or important advising techniques or activities you use and why? Tell me about a time these techniques worked well. A time when they did not?
6. As you reflect on your experience in this program, what would you say has most facilitated your participation as a faculty advisor?
7. What types of changes in your cross-cultural self-efficacy resulted because of this program?
8. What did you learn from the peer mentor?
9. What are some costs of advising to you? (e.g., use of time and resources)
10. Do you believe that the mentoring program enhanced the educational and social experience of first-year DPT students? Why? Why not?
11. How did the mentoring program facilitate first-year DPT students' successful transition to graduate school?
12. What has been your most positive experience in the mentorship program?
13. What suggestions do you have to make the mentorship program more effective and beneficial for faculty, mentors and mentees?
14. Is there anything else that you would like to mention about the mentorship program that I haven't already covered?

Appendix P - Peer and Faculty Mentor PD: Introductory PowerPoint

NETWORKED MENTORING IN A DOCTOR OF PHYSICAL THERAPY PROGRAM



AIM

To determine whether a networked mentoring model can mitigate social isolation and enhance the educational experience of first year racial and ethnic minority Doctor of Physical Therapy students

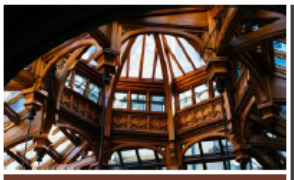


Photo by Chris Abney on Unsplash

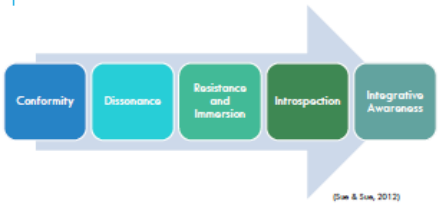
Community Cultural Wealth

Racial and Cultural Identity Development Model

THEORETICAL FRAMEWORKS

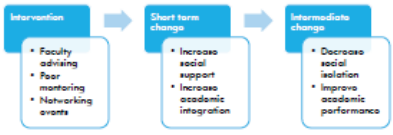
COMMUNITY CULTURAL WEALTH (YOSSO, 2005)

THEORETICAL FRAMEWORK FOR INTERVENTION
RACIAL/CULTURAL IDENTITY DEVELOPMENT MODEL



(Sue & Sue, 2012)

TREATMENT THEORY



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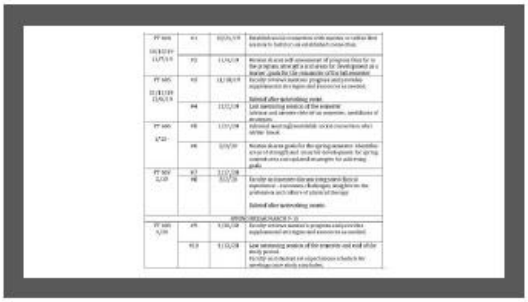
WHAT IS NETWORKED MENTORING?

FACULTY MENTOR

- First year student meets with faculty advisor ten times over the five month study period
- Meetings at the middle and end of a course
- Guidelines for meetings



FF MW 10/15/19 - 11/15/19	#1	10/21/19	Establish social connection with mentee, or rather their interest to build on an established connection.
	#2	11/4/19	Review student self-assessment of progress thus far in the program, now get a sit down for development as a mentor, goals for the remainder of the fall semester.
FF MW 11/18/19 - 12/9/19	#3	11/18/19	Faculty interview mentees' progress and provides supplemental info (topics and resources) as needed.
			Attend after networking event.
	#4	12/2/19	Last networking session of the semester (attend and network after all as semester, semblance of structure).
FF MW 1/7/20 -	#5	1/27/20	Informal meet up/social(talk social connection after winter break
	#6	2/10/20	Review student goals for the spring semester, identifies areas of strength and areas for development for spring, suggests extra curricular strategies for achieving goals.
FF MW 2/20	#7	3/23/20	
	#8	3/23/20	Faculty or mentee (but not both) can bring mentee their experiences - successes, challenges, insights on the profession, each others' stories of the trip.
			Attend after networking event.
			SPRING BREAK MARCH 9-13
FF MW 3/30	#9	3/30/20	Faculty reviews mentee's progress using provides supplemental info (topics and resources) as needed.
	#10	5/11/20	Last networking session of the semester and end of the study period. Faculty and student set objectives to check in for meetings once study concludes.

PEER MENTORING

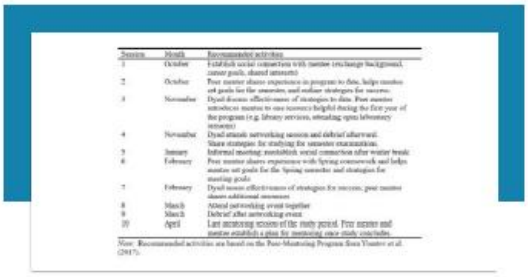
First year student meets with peer mentor ten times over the five month study period

Meetings at the middle and end of a course

Ideally in person

No specified meeting length

Guidelines for meetings



Session	Month	Recommended activities
1	October	Establish social connections with mentee (exchange background, career goals, shared interests)
2	October	Peer mentor shares experiences in program to date, helps mentee set goals for the semester, and outlines strategies for success.
3	November	Dyad discuss effectiveness of strategies to date. Peer mentor introduces mentee to one resource helpful during the first year of the program (e.g. library services, attending open laboratory sessions)
4	November	Dyad attends networking session and debrief afterward.
5	January	Share strategies for studying for semester examinations.
6	February	Informal meeting: reestablish social connection after winter break Peer mentor shares experiences with Spring coursework and helps mentee set goals for the Spring semester and strategies for meeting goals.
7	February	Dyad assess effectiveness of strategies for success, peer mentor shares additional resources
8	March	Attend networking event together
9	March	Debrief after networking event
10	April	Last mentoring session of the study period. Peer mentee and mentor establish a plan for mentoring once study concludes.

Note. Recommended activities are based on the Peer-Mentoring Program from Vranitzer et al. (2017).

FACULTY AND PEER MENTOR MEETINGS

Faculty and peer mentors meet five times over the course of the study period (once a month)

Discuss the needs of the racial and ethnic minority (REM) first year student

Shared learning spaces

NETWORKING EVENTS

Fall - Service Learning
- Dr. Jane Baldwin PT, DPT, NCS
  Service Learning in Guatemala
- Dr. Rawan AlHeresh, MScOT, PhD, OTR/L
  "Toward an All-Inclusive Jordan" Initiative

Spring - Post-graduate paths
social entrepreneurship, residency, fellowship, academia

STUDY TIMELINE: OCTOBER 2019-APRIL 2020

THANK YOU!

"We always hope for the easy fix: the one simple change that will erase a problem in a stroke. But few things in life work this way. Instead, success requires making a hundred small steps go right - one after the other... everyone pitching in."

— Atul Gawande, Better: A Surgeon's Notes on Performance

Appendix Q - Faculty Mentor PD: Needs Assessment Findings PowerPoint

SUPPORTING RACIAL AND ETHNIC MINORITY DPT STUDENTS

NEEDS ASSESSMENT FINDINGS

Kechrie Haidoo
September, 2019

RESEARCH QUESTIONS

RQ1: What factors facilitate racial and ethnic minority student academic success in a DPT program?

RQ2: What barriers impact racial and ethnic minority DPT students' academic success?

RQ3: What are physical therapy students' attitudes and beliefs about the role of mentoring in physical therapy education?

RQ4: What role does racial concordance play in mentoring relationships between physical therapy students and faculty?

MIXED METHODS STUDY (EXPLANATORY SEQUENTIAL DESIGN)

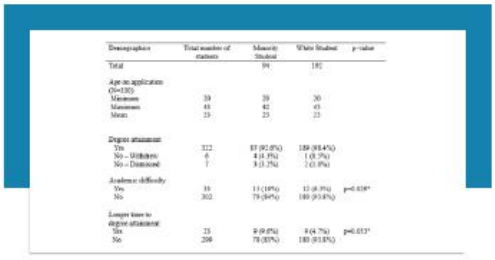
Academic performance data from four cohorts of physical therapy students who graduated between 2014-2018;

Focus group interviews to explore racial and ethnic minority students' perceptions of barriers and facilitators to success and

Campus climate survey administered in 2017 and exit surveys administered in 2013, 2015 and 2016;

Online survey exploring perceptions of mentoring (all students)

MGH INSTITUTE OF HEALTH PROFESSIONS



Demographics	Total number of students	Minority Student	White Student	p-value
Total		94	192	
Age on application (N=130)				
Minimum	19	19	20	
Maximum	48	42	48	
Mean	23	23	23	
Degree attainment				
Yes	322	87 (92.6%)	189 (98.4%)	
No – Withdrew	6	6 (6.4%)	1 (0.5%)	
No – Dismissed	7	1 (1.1%)	2 (1.0%)	
Academic difficulty				
Yes	35	15 (16%)	12 (6.3%)	p=0.038*
No	302	79 (84%)	180 (93.8%)	
Longer time to degree attainment				
Yes	23	9 (9.6%)	9 (4.7%)	p=0.033*
No	298	78 (83%)	180 (93.8%)	

Markers of Academic Difficulty

Marker of Academic Difficulty	REM Students	White Students
Exam grade < 80%	10 (10.6%)	9 (4.7%)
Exam grade < 75%	5 (5.3%)	7 (3.6%)
Practical failure	10 (10.6%)	8 (4.2%)
Difficulty on a clinical education course	10 (10.6%)	8 (4.2%)

Note: Difficulty on a clinical education experience was determined by surveying clinical education faculty to identify students who needed additional academic support while on a clinical experience. Students of unknown race or ethnicity were excluded from analysis.

ACADEMIC DIFFICULTY

FOUR COHORTS OF DPT GRADUATES 2014-2018

Dependent variable	REM N = 94	White N=192
Degree attainment	92.6%	98.4%
Academic difficulty	16.0%*	6.3%
Longer time to degree attainment	9.6%*	4.7%

* p<0.05

1

FOCUS GROUP INTERVIEWS

Nine female, six male students

First year (10 students), second year (1 student), third year (1 student), graduates (three)

Self-identified as:

Black (6)

Asian (5)

Hispanic (4)

Two pilots, four focus groups

Thematic analysis (Braun & Clarke, 2006)

DEFINING SUCCESS

Balance

Family

Work

Self-care/spirituality/joy

Stability

Full Time employment

Financial security

Focused career path

Service

Minority communities

Minority students

Profession

DEFINING SUCCESS

"Growing up when I came here, I had to translate for my parents, and sadly they had a lot of work injuries, so I feel like if I'm able to help people like that, I'll be successful" (Focus group four, student one).

"I mean for me success is being able to help people from my community. There's not a lot of representation, so I feel like I would feel successful when I'm at a point when I'm able to help someone that was in my … position before" (Focus group four, student one).

FACILITATORS TO SUCCESS

- **Authenticity**
  - Relationships with minority peers
  - Clinical education
  - Application
  - Collaboration
- **Support**
  - Family
  - Faculty
  - Role models
  - Mentoring programs

AUTHENTIC RELATIONSHIPS WITH MINORITY PEERS

"I can talk a certain way, I can act a certain way and I know she doesn't look at me differently and I think in that kind of comfort zone, in people who maybe don't even look like me but culturally have the same kind of background" (Focus group three, student one).

"It was always very honest and joyful and always trying to make everyone laugh. It was never about our struggles of being a minority" (Pilot, student two).

"I think we could feel open about giggling about our own differences without feeling judged or making anyone else feeling uncomfortable" (Pilot, student two).

AUTHENTIC RELATIONSHIPS WITH FACULTY

"I think for me overall, it's just the enthusiasm from all the professors. They're all here engaged in your learning and want you to learn what they have to give, which I think is very important when you're learning from someone that they actually want you to learn and they're excited about what they're teaching you" (Focus group one, student five).

"I had plenty of times where I would stop by a professor's office hours or email and in those instances, they were very open to answering my question and offering further help" (Focus group two, student one).

FOCUS GROUP INTERVIEWS – BARRIERS TO SUCCESS

- Racial insensitivity
  - Stereotyping
  - Tokenism
  - Microaggressions
- Segregation
  - Culture and language
  - Outsiders
- Bilingual status
  - Technical language of curriculum

MICROAGGRESSIONS

"I was talking, "Oh, I hated summer camp". And then the guy said to me "What camp did you do?" And I said, "Oh, I was on the swim team", and he goes "Oh, you can swim?" And I said, I kind of laughed because most of the time I tend to just laugh because that's my way of not being frustrated or not being angry with someone because I don't want to be seen as an angry Black person or a loud Black person, so I just sort of laughed" (Focus group three, student one).

"especially because we're in doctorate education, you get a lot of people that are very similar in terms of their backgrounds and things and a lot of people who, through no fault of their own, are privileged. I think a lot of them don't have a lot of interactions with people who don't look like them or act like them" (Focus group three, student one).

BARRIERS – A LACK OF REPRESENTATION

- Peers
- Academic faculty – core and associated
- Clinical faculty

Unsplash photo by Artur Poloxin

LACK OF REPRESENTATION

"I mean, I'm an African American woman and I don't think we've had a single LI that looks like me" (Focus group one, student two).

"he is a white male and just kind of relating some of the things that I have issues with as being someone who is a black female, first generation, like the things I have struggled with. How do I voice that to someone who probably won't understand? I think that was my biggest challenge, going through my first year having a problem and not having someone who I can relate that to" (Focus group one, student five).

"I haven't seen any Black PTs. I haven't seen any Black doctors, so as somebody who's not originally from Boston and came here for school, I know I'm very far from graduating and getting a job, but it makes me think about okay when I graduate is this a place that I want to stay? Is this a place where I go and get a job? Am I going to be the only person who looks like me? Because that doesn't encourage me to want to stay" (Focus group one, student two).

SUMMARY

Racial and ethnicity associated with academic difficulty and a longer time to degree completion

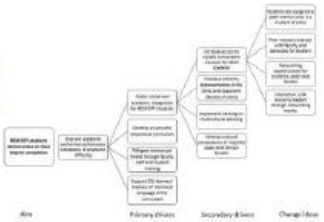
A higher percentage of REM students withdraw from the program over the four-year study period

Focus group interviews – can be unique and isolating experience for minority students

Lack of representation in the clinic and in the classroom as barriers to their success, few minority role models

Need for an intervention to target social isolation which is linked to academic difficulty

DRIVER DIAGRAM



PROPOSED INTERVENTION

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Appendix R - Faculty Mentor PD: From Advising to Mentoring PowerPoint

1

COLE AND WRIGHT - HARP MULTIPLE MENTOR APPROACH

Figure 1. Cole and Wright-Harp Multiple Mentor Model.

COMPONENTS OF MENTORSHIP

1. Focus on growth and development of another
2. Forms of support
   1. Role modeling
   2. Psychological support
3. Reciprocity

Unsplash photo by Yannis A.

FIVE TIER MENTORING MODEL

1. Commitment to the mentoring process
2. Establishing mentoring venues
3. Serving as a role model
4. Employing successful tools
5. Monitoring mentees progress

Unsplash photo by Jerry Wang

1. COMMITMENT TO THE MENTORING PROCESS

- Adequate time for quality mentoring
- A minimum number of meetings
- Communication between meetings
- Time directed goals

2. ESTABLISH MENTORING VENUES

- Discuss meeting venues
- Utilize a variety of communication strategies:
- In-person
- Written communication
- Virtual meetings

Unsplash photo by Kevin Bhagat

3. ROLE MODELING

- Mirroring an excellent professional image
- Covering a session for the profession
- "socializing or influence agents, encouraging protégés to internalize the norms, behaviors, and values of the scientific community" (Hernandez, Estrada, Woodcock, & Schultz, 2017, p. 462).

Unsplash photo by Ian Schneider

4. EMPLOY SUCCESSFUL TOOLS

- Time ordered mentoring plan
- Provide mentoring plan updates
- Encourage mentee to attend professional development workshops (networking events)

5. MONITORING MENTEE'S PROGRESS

- Individualized mentoring sessions
- Provide updates
- Review the following areas:
  - Coursework
  - Clinical education experiences
  - Research
  - Professional development
  - Concern/challenges
  - Successes

TRUST

- Supportive
- Low risk
- Trying new ways of mentoring and relating
- Make mistakes
- Accept challenges
- Gain feedback

MENTORING GUIDELINES

- Dosage = two meetings per course
- Fall = total of four meetings
- Spring = total of six meetings
- No set length of sessions
- In person recommended
- Zoom meeting capabilities – email Kashrie to schedule
- General guidelines for each session and suggested timing

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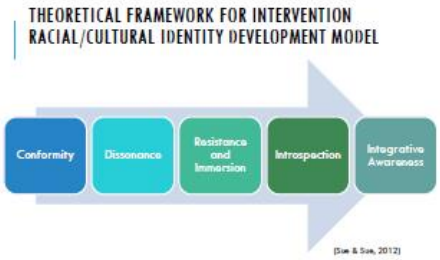
Appendix S - Faculty Mentor PD: Mentoring Minority Graduate Students PowerPoint



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ROLE OF RACE IN MENTORING

- 1,420 underrepresented minority students majoring in STEM in the US
- Quality of mentorship: psychological support, mentoring aided opportunities,
- Perceived similarity more important than demographic similarity (race or gender)
- Hernandez et al. (2017)

KEY PRACTICES IN MENTORING ETHNIC MINORITY PRE-DOCTORAL STUDENTS

- Providing information and advice
- Coaching
- Exposure and visibility
- Sharing personal stories and humor
- Responsiveness
- Validation
- Providing feedback
- Reciprocity

Chan (2002)

UNANTICIPATED FINDINGS

- Discussions about race, privilege, and racism
- Giving time
- Being proactive
- *If you're a teacher or mentor, recognize that not all students have the privilege to know what advice or championing they should be asking for. Make a habit of saying "these are the type of things you can ask me for to help you and your career."* @jenheemstra
- Flexibility and working on goals
- → Mentoring as access

Chan (2002)

A MULTICULTURAL MENTORING MODEL

1. CAREER SUPPORT AND GUIDANCE
2. RELATIONSHIP BETWEEN MENTOR AND PROTÉGÉ
3. SIGNIFICANCE OF CONTEXT
4. MULTI-DIRECTIONALITY OF INTERACTIONS BETWEEN CONTEXTS/ RECIPROCAL RELATIONSHIP

Chan, Yeh, & Krumboltz (2015)

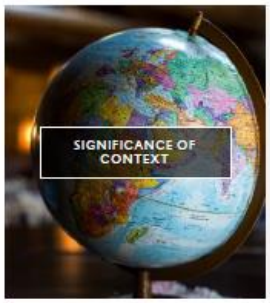
CAREER SUPPORT AND GUIDANCE

- Proactive offering advice and help
- Provided quality feedback
- Built confidence
- Customized guidance
- Acknowledged challenges

RELATIONSHIP BETWEEN MENTOR AND PROTEGE

- Relationship and trust building
- Ability to talk about race and culture
- Listened and validated mentee experience
- Understanding multiple identities
- Use of humor
- Admitting limitation and mistakes

Unsplash photo by Lidra Nada



SIGNIFICANCE OF CONTEXT

- Understood four layers of context:
  a. Family and community
  b. University
  c. Field and profession
  d. Society and culture

MULTIDIRECTIONALITY

- Reciprocal relationship
- How mentoring had benefited them

RECOMMENDATIONS

- Recognize the limitations of one's competence and knowledge
- Take the initiative to expand one's knowledge of minority issues, needs, resource
- Adopt attitude of caring and interest in learning about minority students
- Questioning and understand how race and culture affect professional aspirations
- Proactive guiding mentees through challenges from racial forces

DISCUSSION BOARD

- What strategies have you utilized to mentor students who are a different race or ethnicity than you?
- What cross cultural strategies might you utilize moving forward?

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Appendix T - Peer Mentor PD: The Power of Peer Mentoring PowerPoint

MENTORING MISCONCEPTIONS

- Formal
- One-on-one
- Long term
- Older and wiser!
- Faculty/Clinical Instructor

Not this friend!

YOU'RE SERVING AS A PEER MENTOR WHEN . . .

- You share stories with students about your own educational career and the ways you overcame obstacles similar to theirs.
- You help students overcome their fear of a professor and help them to ask questions in a class or visit the professor during office hours.
- You show a student how you learned time management to do well in your classes.
- You listen to a student describe a problem and explore resources at the university to deal with the problem.
- You help a new student understand a particularly tough rule or procedure — and you explain it in a way that the student is willing to come back to you to learn about other difficult regulations
- You help a new student understand how to use resources at the university
- You help fellow student achieve the potential within themselves that is hidden to others — and perhaps even to the student themselves.

Oneotta, Peer Mentoring Resource Booklet

PEER MENTOR VS. BUDDY

- Social and academic integration
- Matched by minority status – harness the shared minority experience
- Interactions with faculty – advocacy
- Training

EVIDENCE ON PEER MENTORING

Quality relationships with fellow students can also foster social integration and contribute to academic persistence and success

Minority students who are matched with minority upperclassmen who have been successful, show enhanced self-efficacy

(Fullick, Smith-Jentsch, Yarbrough & Scielzo, 2012; Tinto, 1993; Walton et al., 2012; Yomtov, Plunkett, Efrat, & Marin, 2017).

1

YOUR MENTORS ...

Who were they?

What were their characteristics?

What did your mentor do to strengthen the mentoring relationship?

Unsplash photo by Lucas Lenzi

THE ROLE OF THE MENTOR

Kram (1985) presents two functions of the mentor:

1. Career functions - coaching, sponsorship, visibility, and exposure

2. Psychological functions - role modeling, acceptance, friendship

THE BENEFIT OF A ROLE MODEL

Role modeling fosters the development of complex skills

Time to master new behaviors can be abbreviated through observing role models.

By observing role models, protégés learn to navigate novel situations rather than relying on trial and error

(Bandura, 1986)

MENTOR PRACTICES IDENTIFIED IN THE LITERATURE

- Honest self-disclosure and mutuality
- Listening
- Demonstrating respect
- Being accessible
- Initiating and maintaining regular contact
- Asking open-ended questions
- Defining clear goals and expectations for the relationship
- Reviewing goals
- Providing feedback
- Expressing confidence
- Providing information, guidance, expertise, and advice
- Creating opportunities
- Teaching the unwritten rules of the organisation/field

Chen, 2008

PRE REQUISITES FOR PEER MENTORS FROM LITERATURE

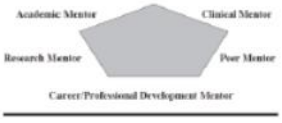
- Ability and willingness to commit time
- University experience (navigating the university environment)
- Academic achievement (increases credibility)
- Prior mentoring experience
- Shared program of study
- Gender and race

Criteria for providing emotional support:

- Communication skills
- Supportiveness
- Trustworthiness
- Interdependent attitude
- Empathy
- Enthusiasm
- Flexibility

(Terrion & Leonard, 2007)

Figure 1. Cole and Wright-Harp Multiple Mentor Model



WHAT A PEER MENTOR DOES…

You model the behavior and success that first year students strive for…

Students may feel more comfortable asking you questions than their faculty advisor

You can help your mentee to formulate their questions for faculty

You can steer your mentee towards valuable resources that you found helpful when you first started in the program

You can help your mentee discover and work towards their highest potential

"The fundamental task of the mentor is a liberatory task. It is not to encourage the mentor's goals and aspirations and dreams to be reproduced in the mentees, the students, but to give rise to the possibility that the students become the owners of their own history".

Paulo Freire, Mentoring the Mentor (1997)

WHAT A PEER MENTOR IS NOT…

* A (surrogate) parent
* A professional counselor or therapist
* A flawless or infallible idol
* A social worker
* A landing institution

Gordon Nakagawa, Peer Mentoring Resource booklet

DISCUSSION BOARD POST

- Ability and willingness to commit time
- University experience (navigating the university environment)
- Academic achievement (increases credibility)
- Prior mentoring experience
- Shared program of study
- Gender and race

Criteria for providing emotional support:

- Communication skills
- Supportiveness
- Trustworthiness
- Interdependent attitude
- Empathy
- Enthusiasm
- Flexibility

(Terrion & Leonard, 2007)

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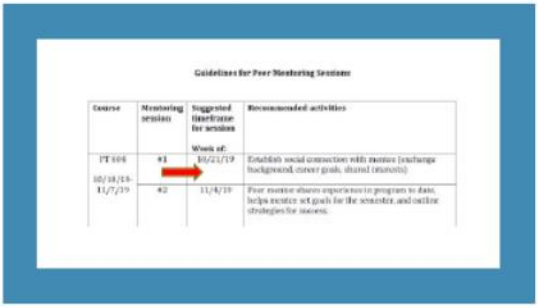
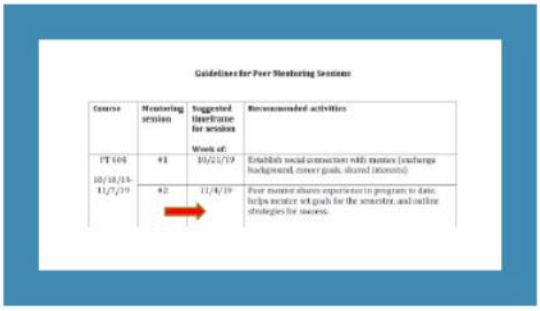
Appendix U - Peer Mentor PD: Belonging and Academic Outcomes PowerPoint



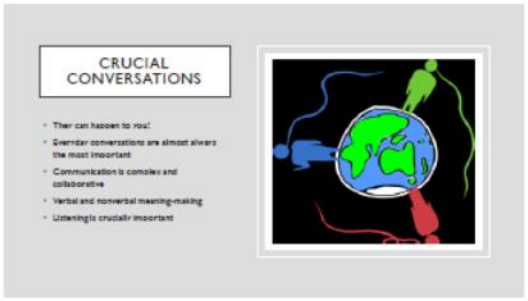
1

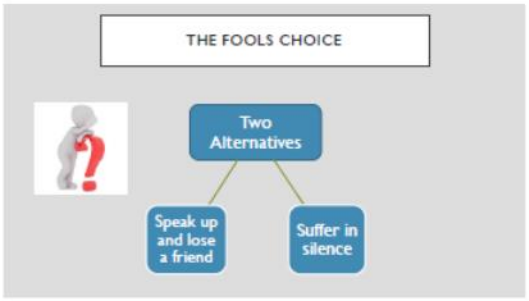

MITIGATE STEREOTYPE THREAT
Associate with people who can support realism and hopefulness
1. Build trust and show investment in your mentee
2. Acknowledge reality
3. Share a hopeful narrative
4. Show that you are committed to your mentee's success


Guidelines for Peer Mentoring Sessions
Course
Mentoring session
Suggested timeframe for session
Recommended activities
Week of:
IT 104
#1
10/21/19
Establish social connection with mentee (exchange background, career goals, shared interests)
10/18/19-11/7/19
#2
11/4/19
Peer mentor shares experience in program to date, helps mentee set goals for the semester, and outline strategies for success.


DISCUSSION BOARD
Youbelonghere
Unsplash photo by Amer Ploghawish

Appendix V - Peer Mentor PD: Having Crucial Conversations PowerPoint





1

GOAL

- Get all relevant information out in the open
- Dialogue
- A pooled IQ; diversity of thought
- → smarter decisions and better outcomes

START WITH HEART

1. Stay focused on what you really want

Questions to ask yourself:

- What do I really want for myself?
- What do I really want for others?
- What do I really want for this relationship?
- How would I behave if I really wanted these things?

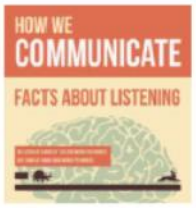
LEARN TO LOOK

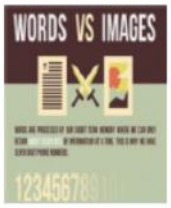
- Dialogue = free flow of meaning
- Fear shuts that down
- Notice when safety is at risk
- Think about a time you received feedback and accepted it, welcomed it
- What were those settings like?

MAKE IT SAFE

- Stop and make it safe (reset)
- Look for a mutual purpose
- Create mutual respect

- Apologize
- Fix any misunderstandings
- Create the mutual purpose





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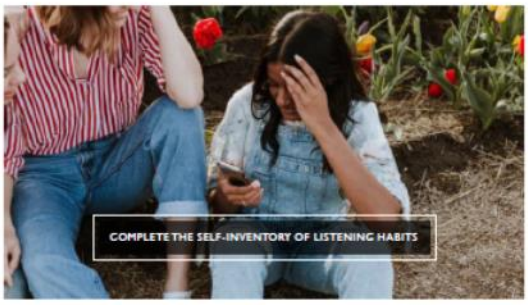

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Appendix W - Peer Mentor PD: The Three Pillars of Mentoring PowerPoint

1

Appendix X - Guidelines for Peer Mentoring Sessions

Course	Mentoring session	Suggested timeframe for session Week of:	Recommended activities
PT 604 10/10/19-11/7/19	#1	10/28/19	Establish social connection with mentee (exchange background, career goals, shared interests) Attend networking event together.
PT 605 11/11/19-12/6/19	#2	11/11/19	Debrief on networking event Peer mentor shares experience in program to date, helps mentee set goals for the semester, and outline strategies for success.
	#3	11/25/19	Discuss effectiveness of strategies to date. Peer mentor introduces mentee to one resource helpful during the first year of the program (e.g. library services, attending open laboratory sessions, meeting with faculty)
	#4	12/9/19	Share strategies for studying for semester examinations, managing stress levels!
PT 606 1/13/20 – 2/7/20	#5	1/20/20	Informal meeting to reestablish social connection after winter break
	#6	2/3/20	Peer mentor shares experience with Spring coursework and helps mentee set goals for the Spring semester and strategies for meeting goals Connect at CSM if attending
PT 607 2/10	#7	2/17/20	During Full Time 2 – mentors may need to connect virtually with mentees Assess effectiveness of strategies for success; provide additional resources as needed
	#8	3/2/20	Check in virtually to assess mentees needs.
SPRING BREAK MARCH 9-15			
PT 608 3/20/20-4/16/20	#9	3/30/20	Informal meeting
	#10	4/13/20	Last mentoring session of the study period. Peer mentor and mentee establish a plan for mentoring once study concludes.

Appendix Y - Guidelines for Faculty Mentoring Sessions

Course	Mentoring session	Suggested timeframe for session Week of:	Recommended activities
PT 604 10/10/19- 11/7/19	#1	10/21/19	Establish social connection with mentee or utilize first session to build on an established connection.
	#2	11/4/19	Mentee shares self-assessment of progress thus far in the program, strengths and areas for development as a learner, goals for the remainder of the fall semester
PT 605 11/11/19- 12/6/19	#3	11/18/19	Faculty reviews mentees progress and provides supplemental strategies and resources as needed. Debrief after networking event.
	#4	12/2/19	Last mentoring session of the semester Advisor and mentee debrief on semester, usefulness of strategies.
PT 606 1/13 -	#5	1/27/20	Informal meeting to reestablish social connection after winter break Debrief after networking event
	#6	2/3/20	Mentee shares goals for the spring semester. Identifies areas of strength and areas for development for spring content area and updated strategies for achieving goals.
PT 607 2/10	#7	2/17/20	
	#8	3/2/20	Faculty and mentee discuss integrated clinical experience – successes, challenges, insight into the profession and culture of physical therapy
SPRING BREAK MARCH 9-15			
PT 608 3/20	#9	3/30/20	Faculty reviews mentee's progress and provides supplemental strategies and resources as needed.
	#10	4/13/20	Last mentoring session of the semester and end of the study period. Faculty and student set expectations schedule for meetings once study concludes.

Appendix Z - Guiding Questions for Peer Mentor Meetings

1. Tell me about your experience in this program.
2. What would you say has most facilitated your academic success?
3. What kinds of challenges have you faced getting to this point in the physical therapy program?
4. How would you describe the racial climate during your physical therapy educational experience?
5. How do you think your peer mentee perceives the climate on campus?
6. What things are available to your mentee — or should be available to them —to help them achieve success in this program moving forward?

Appendix AA - Process Evaluation Summary Matrix

RQ1: How has the study implementation adhered to or differed from the proposed implementation procedures?

Process Evaluation Indicator(s)	Data Source(s)	Data Collection Tool	Frequency	Data Analysis
Number of mentoring sessions and networking events attended by participants	First-year REM DPT students	Electronic survey (see Appendix G): How many mentoring sessions did you attend with your faculty advisor this semester? How many mentoring sessions with your peer mentor did you attend this semester? How many networking events did you attend this semester?	Collected at the midpoint in the intervention and at the end of the study period	Descriptive statistical analysis
Components of mentorship received by participants		Sample survey questions based on the five-tier mentoring program (Wright-Harp & Cole, 2008): My faculty advisor provides adequate time for quality mentoring My faculty advisor communicates between meetings		Descriptive statistical analysis
		Open-ended questions modified from Spivey-Mooring and Apprey (2014) Sample questions: What is the greatest strength of this program? What has been your most positive experience in the mentorship program thus far? What suggestions do you have to make the mentorship program more effective and beneficial for student participants?		Thematic analysis using the six-step process for thematic analysis identified by Braun and Clarke (2006)
				Plan for mixing data:

Process Evaluation Indicator(s)	Data Source(s)	Data Collection Tool	Frequency	Data Analysis
				Quantitative data correlated with qualitative data Data from both quantitative and qualitative sources consolidated Data integration: Quantitative and qualitative data presented as a coherent whole

Appendix BB - Outcome Evaluation Summary Matrix: Isolation and Belonging

RQ2: To what extent does a networked mentoring model mitigate social isolation for first year REM DPT students?

RQ3: To what extent does a networked mentoring model foster sense of belonging for first-year REM DPT students?

Construct	Data Source(s)	Data Collection Tool	Frequency	Data Analysis
Social isolation	First-year REM DPT students	CEQ (Spivey-Mooring & Apprey, 2014; see Appendix J) university alienation subscale Items 4, 6, 15, 19, 20 Sample question for this construct: "I feel socially alienated at this institution"	CEQ: Administered pre (September 2019) and post intervention (April 2020)	Descriptive statistics on CEQ score pre and post intervention for students in intervention and comparison groups
Sense of belonging		CEQ (Spivey-Mooring & Apprey, 2014) university connectedness subscale Items 1, 3, 9, 13, 14, 16, 21 Sample question for this construct: "I represent the kind of student the institution is proud to have as part of its student body"		
		Focus group interviews with first year REM DPT students. Interview protocol modified from Spivey-Mooring and Apprey (2014) see Appendix M Sample questions include: "Did the mentoring program enhance your educational and social experience? If so, how?" "In what ways do you feel that the mentoring program facilitates first-year students' successful transition to graduate school?" How has the intervention shaped feelings of connectedness or alienation	Focus group interviews post intervention (April 2020)	Thematic analysis

Construct	Data Source(s)	Data Collection Tool	Frequency	Data Analysis
		within the university community?" "What is the greatest strength of this program? What has been your most positive experience?"		Mixing data: Quantitative data correlated with qualitative data Quantitative and qualitative data sources consolidated Data integration: Quantitative and qualitative data presented as a coherent whole

Appendix CC - Outcome Evaluation Summary Matrix: Psychological Capital and Mentoring

RQ4: How does participation in a networked mentoring model contribute to DPT faculty's cross-cultural psychological capital?
RQ5: How do REM DPT peer mentors guide faculty to meet the unique mentoring needs of first-year REM DPT students?

Construct	Data Source(s)	Data Collection Tool	Frequency	Data Analysis
Cross-cultural psychological capital	DPT Faculty	Cross-cultural PysCap (Dollwet & Reichard, 2014)	Survey administered at the beginning and end of the study period	Descriptive and inferential statistics
		Interview protocol (modified from Chan et al., 2015; see Appendix O). Sample questions: "What is the role of race and ethnicity in your mentoring?" "When your race/ethnicity is different from your protégé—how do you deal with it?" "What, if anything, did you learn from the peer mentor?" "What types of changes in your cross-cultural self-efficacy resulted because of this program?"	Focus group interviews post intervention (April 2020)	Thematic analysis
Mentoring needs	Peer mentors	Electronic survey. Sample questions: "How do you guide your mentee's faculty advisor to appreciate the unique needs or racial and ethnic minority students?" "Do you find it challenging to advocate for your mentee? If so, how and why?" "What suggestions do you have to make the mentorship program more effective and beneficial for participants?"	Survey administered at mid and end study points	Thematic analysis

Construct	Data Source(s)	Data Collection Tool	Frequency	Data Analysis
		Focus group sample questions: "How did you increase faculty awareness of the unique mentoring needs of racial/ethnic minority students?" "Can you tell me about a time when there was a barrier to advocating for your mentee's needs and how you overcame this barrier?"	Focus group interviews post intervention (April 2020)	Thematic analysis

Appendix DD - Outcome Evaluation Summary Matrix: Professional Socialization

RQ6: How does participation in a networked mentoring program contribute to second-year REM DPT students' socialization into the physical therapy profession?

Construct	Data Source(s)	Data Collection Tool	Frequency	Data Analysis
Professional socialization	Peer mentors	Focus group interview protocol (see Appendix N) Sample questions: "Socialization involves the process by which individuals gain the knowledge, skills, and values necessary for successful entry into a professional career. How has your involvement in this program influenced your socialization into the physical therapy profession?" "What was your perception of an academic career before serving as a peer mentor? Has your perception changed after serving as a peer mentor? If so, how?"	Focus group interviews post intervention (April 2020)	Thematic analysis

Appendix EE - First Year Comparison Group Recruitment Letter

Study Title: Networked Mentoring in a Doctor of Physical Therapy Program

Principal Investigator: Dr. Keshrie Naidoo PT, DPT, MS, OCS

Assistant Professor, MGH Institute of Health Professions

You are being asked to participate in a research study investigating student experience in a Doctor of Physical Therapy (DPT) Program. All first-year DPT students currently enrolled in the MGH Institute DPT Program are being asked to complete an online survey now (September 2019), at the middle of the study period (December 2019), and at the end of the study period (April 2020). Each survey takes approximately 10 minutes to complete.

Please contact the Principal Investigator, Keshrie Naidoo PT, DPT, MS, OCS, with any questions you may have: (617) 724-4848.

If you decide to participate, you will be issued a participant identification number by the researcher to allow the researcher to compare your responses on each of the surveys completed throughout the study period. By completing the survey, you are consenting to be in this research study. Your participation is voluntary, and you can stop at any time.

Appendix FF - First-Year DPT Student (Intervention Group) Recruitment Letter

Study Title: Networked Mentoring in a Doctor of Physical Therapy Program

Principal Investigator: Dr. Keshrie Naidoo PT, DPT, MS, OCS

Assistant Professor, MGH Institute of Health Professions

You are being asked to participate in a research study investigating the effects of a mentoring program for racial and ethnic minority students enrolled in the first year of a Doctor of Physical Therapy Program. All first-year DPT students enrolled at the MGH Institute of Health Profession who self-identified as belonging to a racial or ethnic minority group upon application to the program are being asked to participate.

Please contact the Principal Investigator, Keshrie Naidoo PT, DPT, MS, OCS, with any questions you may have: (617) 724-4848 or knaidoo@mghihp.edu.

If you decide to participate, you will be issued a participant identification number by the researcher. You are being asked to meet with your faculty advisor ten times between October 2019 and April 2020. In addition, you will meet with your peer mentor ten times between October 2019 and April 2020. You will be asked to attend two networking events with your faculty advisor and peer mentor. You will be asked to complete a survey at the mid- and end point of the study period and participate in a focus group interview at the end of the study period (April 2020). The interview will last no more than 45 minutes. Your participation in this study is voluntary, and you can stop at any time.

Appendix GG - Peer Mentor Recruitment Letter

Study Title: Networked Mentoring in a Doctor of Physical Therapy Program

Principal Investigator: Dr. Keshrie Naidoo PT, DPT, MS, OCS

Assistant Professor, MGH Institute of Health Professions

You are being asked to participate in a research study investigating the effects of a mentoring program for racial and ethnic minority students enrolled in the first year of a Doctor of Physical Therapy Program. All second-year DPT students enrolled at the MGH Institute of Health Profession who self-identified as belonging to a racial or ethnic minority group upon application to the program are being asked to participate as peer mentors to racial and ethnic minority first year DPT students.

Please contact the Principal Investigator, Keshrie Naidoo PT, DPT, MS, OCS, with any questions you may have: (617) 724-4848 or knaidoo@mghihp.edu.

If you decide to participate, you will be issued a participant identification number by the researcher and directed to an online training module. The training module takes approximately ten hours to complete. Training can be completed over a one-month period. You are being asked to meet with your peer mentee ten times between October 2019 and April 2020. In addition, you will meet with your advisee's faculty advisor a total of five times. You will also be asked to attend two networking events with your mentee and participate in a focus group interview at the end of the study period (April 2020). The interview will last no more than 45 minutes. You are offered a stipend of $100 for your participation in this study. Your participation in this study is voluntary, and you can stop at any time.

Appendix HH - Faculty (Comparison Group) Survey Recruitment Letter

Study Title: Networked Mentoring in a Doctor of Physical Therapy Program

Principal Investigator: Dr. Keshrie Naidoo PT, DPT, MS, OCS

Assistant Professor, MGH Institute of Health Professions

You are being asked to participate in a research study investigating student and faculty experience in a Doctor of Physical Therapy (DPT) Program. All core faculty currently teaching in the MGH Institute DPT Program are being asked to complete an online survey now (September 2019) and at the end of the study period in April 2020. The survey takes approximately 10 minutes to complete.

Please contact the Principal Investigator, Keshrie Naidoo PT, DPT, MS, OCS, with any questions you may have: (617) 724-4848.

If you decide to participate, you will be issued a participant identification number by the researcher to allow the researcher to compare your responses on each of the surveys completed throughout the study period. By completing the survey, you are consenting to be in this research study. Your participation is voluntary, and you can stop at any time.

Appendix II - DPT Faculty Mentor Recruitment Letter

Study Title: Networked Mentoring in a Doctor of Physical Therapy Program

Principal Investigator: Dr. Keshrie Naidoo PT, DPT, MS, OCS

Assistant Professor, MGH Institute of Health Professions

You are being asked to participate in a research study investigating the effects of a mentoring program for racial and ethnic minority students enrolled in the first year of a Doctor of Physical Therapy Program. All core faculty at the MGH Institute DPT Program are being asked to participate in a networked mentoring model.

Please contact the Principal Investigator, Keshrie Naidoo PT, DPT, MS, OCS, with any questions you may have: (617) 724-4848 or knaidoo@mghihp.edu.

If you decide to participate, you will be issued a participant identification number by the researcher and directed to an online training module. The training module takes approximately one hour to complete. You are being asked to meet with your advisee ten times over the course of the two-semester long study period (October 2019 – April 2020). In addition, you will meet with your advisee's peer mentor a total of five times. You will also be asked to attend two networking events with your advisee and participate in a focus group interview at the end of the study period (April 2020). The interview will last no more than 45 minutes. Your participation is this study is voluntary, and you can stop at any time.

Appendix JJ – Mentee Informed Consent Form

Johns Hopkins University

Homewood Institutional Review Board (HIRB)

Informed Consent Form

Title:	Networked Mentoring in a Doctor of Physical Therapy Program
Principal Investigator:	Dr. Yolanda Abel, Johns Hopkins School of Education
Date:	6/25/19

PURPOSE OF RESEARCH STUDY:

The purpose of this research study is to investigate the effect of a mentoring model on the educational experience of first year racial/ethnic minority students enrolled in a Doctor of Physical Therapy (DPT) Program. We anticipate that ten first-year DPT students will participate in this study.

PROCEDURES:

As part of your participation in this study, you are being asked to meet with your faculty advisor ten times between October 2019 and April 2020 and meet with your peer mentor ten times during this period. There are no specifications for how long meetings should take. In addition, you will attend a total of two networking events over the course of the study period (one in November 2020 and one in February 2020). You are being asked to complete a mid- and end of program study survey and participate in a focus group interview at the end of the study period. Each survey takes approximately ten minutes to complete. The focus group interview will last no longer than 45 minutes and will take place during the month of April 2020.

RISKS/DISCOMFORTS:

There is risk of discomfort with some of the survey questions and focus group questions and you may skip any questions you don't wish to answer or end your participation at any time. The risks associated with participation in this study are no greater than those encountered in daily life.

BENEFITS:

There are no direct benefits to you from participating in this study. However, participating in the study will assist in guiding the student investigator in making recommendations to improve the educational experience for DPT students.

VOLUNTARY PARTICIPATION AND RIGHT TO WITHDRAW:

Your participation in this study is entirely voluntary: You choose whether to participate. If you decide not to participate, there are no penalties, and you will not lose any benefits to which you would otherwise be entitled. If you choose to participate in the study, you can stop your participation at any time, without any penalty or loss of benefits. If you want to withdraw from the

study, please inform the student investigator, Keshrie Naidoo.

CONFIDENTIALITY:

We are collecting this data (survey and focus group interview data) for research purposes only. We will not provide you or anyone else your specific responses. All data will be aggregated (i.e. we will combine your responses with the responses of all other participants). Data will be stored on Partners encrypted computers and behind the Partners firewall.

To compare your pre- and post-study survey responses, we will assign you a participant identification number. However, your response and feedback will be confidential and not linked back to your name in reporting.

We will begin the focus group by asking the participants to agree to the importance of keeping information discussed in the focus group confidential. In addition, we will ask each participant to verbally agree to keep everything discussed in the room confidential and will remind them at the end of the group not to discuss the material outside. The interview will be audio recorded and transcribed. All identifying information will be removed. We ask that you do not reveal identifying information about yourself and others in the group.

Any study records that identify you will be kept confidential to the extent possible by law. The records from your participation may be reviewed by people responsible for making sure that research is done properly, including members of the Johns Hopkins University Homewood Institutional Review Board and officials from government agencies such as the National Institutes of Health and the Office for Human Research Protections. (All of these people are required to keep your identity confidential.) Otherwise, records that identify you will be available only to people working on the study, unless you give permission for other people to see the records.

COMPENSATION:

You will not receive any payment or other compensation for participating in this study.

IF YOU HAVE QUESTIONS OR CONCERNS:

You can ask questions about this research study now or at any time during the study, by talking to or by calling the student researcher Keshrie Naidoo at 617-724-4848.

If you have questions about your rights as a research participant or feel that you have not been treated fairly, please call the Homewood Institutional Review Board at Johns Hopkins University at (410) 516-6580 or contact the Partners Human Research Committee at (857) 282-1900.

Appendix KK – Peer Mentor Informed Consent Form

Johns Hopkins University

Homewood Institutional Review Board (HIRB)

Informed Consent Form

Title:	Networked Mentoring in a Doctor of Physical Therapy Program
Principal Investigator:	Dr. Yolanda Abel, Johns Hopkins School of Education
Date:	8/18/19

PURPOSE OF RESEARCH STUDY:

The purpose of this research study is to investigate the effect of a mentoring model on the educational experience of first year racial/ethnic minority students enrolled in a Doctor of Physical Therapy (DPT) Program. We anticipate that ten second-year DPT students will participate in this study as peer mentors.

PROCEDURES:

Your information was obtained from student contact lists at the MGH Institute of Health Professions. All second-year DPT students who self-identified as belonging to a racial or ethnic minority group upon application to the MGH Institute DPT program are being asked to participate in this study as peer mentors.

Each racial and ethnic minority first-year student participant in this program will be assigned a peer mentor. You are being asked to complete an online peer mentor training program and meet with your mentee ten times from October 2019 – April 2020. The peer mentoring training program takes a total of ten hours to complete and can be completed over the course of one month (September 2020). You will meet with your mentee's faculty advisor five times over the course of the study and be asked to attend two networking events with your peer mentee. Participating in the study will involve the completion of an online survey once in the middle of the study period (December 2019) and once at the end of the study period (April 2020). Survey completion takes approximately 10 minutes. Participants will also be asked to participate in a focus group interview at the end of the study period (April 2020). The interview will last no more than 45 minutes.

RISKS/DISCOMFORTS:

There are minimal risks from participating in this research. However, it will take time to complete the training and surveys, meet with your mentee, their faculty advisor, and attend networking events. There is risk of discomfort with some of the survey questions and focus group questions and you may skip any questions you don't wish to answer or end your participation at any time. The risks associated with participation in this study are no greater than those encountered in daily life.

BENEFITS:

You are being offered a $100 stipend for participation, which will be paid by check at the end of the study period (April 2020). Additionally, participating in the study will assist in guiding the researcher in making recommendations to improve the educational experience for DPT students.

VOLUNTARY PARTICIPATION AND RIGHT TO WITHDRAW:

Your participation in this study is entirely voluntary: You choose whether to participate. If you decide not to participate, there are no penalties, and you will not lose any benefits to which you would otherwise be entitled. If you choose to participate in the study, you can stop your participation at any time, without any penalty or loss of benefits. If you want to withdraw from the study, please inform the student investigator, Keshrie Naidoo.

CONFIDENTIALITY:

We are collecting this data (survey and focus group interview data) for research purposes only. We will not provide you or anyone else your specific responses. All data will be aggregated (i.e. we will combine your responses with the responses of all other participants). Data will be stored on Partners encrypted computers and behind the Partners firewall.

To compare your pre- and post-study survey responses, we will assign you a participant identification number. However, your response and feedback will be confidential and not linked back to your name in reporting.

We will begin the focus group by asking the participants to agree to the importance of keeping information discussed in the focus group confidential. In addition, we will ask each participant to verbally agree to keep everything discussed in the room confidential and will remind them at the end of the group not to discuss the material outside. The interview will be audio recorded and transcribed. All identifying information will be removed. We ask that you do not reveal identifying information about yourself and others in the group.

Any study records that identify you will be kept confidential to the extent possible by law. The records from your participation may be reviewed by people responsible for making sure that research is done properly, including members of the Johns Hopkins University Homewood Institutional Review Board and officials from government agencies such as the National Institutes of Health and the Office for Human Research Protections. (All of these people are required to keep your identity confidential.) Otherwise, records that identify you will be available only to people working on the study, unless you give permission for other people to see the records.

COMPENSATION:

You are being offered a $100 stipend for participation, which will be paid by check at the end of the study period (April 2020).

IF YOU HAVE QUESTIONS OR CONCERNS:

You can ask questions about this research study now or at any time during the study, by talking to or by calling the student researcher Keshrie Naidoo at 617-724-4848.

If you have questions about your rights as a research participant or feel that you have not been treated fairly, please call the Homewood Institutional Review Board at Johns Hopkins University at (410) 516-6580 or contact the Partners Human Research Committee at (857) 282-1900.

Appendix LL – Faculty Mentor Informed Consent Form

Johns Hopkins University

Homewood Institutional Review Board (HIRB)

Informed Consent Form

Title:	Networked Mentoring in a Doctor of Physical Therapy Program
Principal Investigator:	Dr. Yolanda Abel, Johns Hopkins School of Education
Date:	8/18/19

PURPOSE OF RESEARCH STUDY:

The purpose of this research study is to investigate the effect of a mentoring model on the educational experience of first year racial/ethnic minority students enrolled in a Doctor of Physical Therapy (DPT) Program.

PROCEDURES:

As a participant in this study, you are being asked to meet with your advisee ten times between October 2019 and April 2020. In addition, you will meet with your advisee's peer mentor five times over the course of the study. You will also be asked to attend two networking events with your advisee. Participating in the study will involve the completion of an online training module once at the beginning of the study period (September 2019). The training module takes approximately one hour to complete. You will also be asked to participate in a focus group interview at the end of the study period (April 2020). The interview will last no more than 45 minutes.

RISKS/DISCOMFORTS:

There is risk of discomfort with some of the focus group questions and you may skip any questions you don't wish to answer or end your participation at any time. The risks associated with participation in this study are no greater than those encountered in daily life.

BENEFITS:

There are no direct benefits to you from participating in this study. However, participating in the study will assist in guiding the student investigator in making recommendations to improve the educational experience for DPT students.

VOLUNTARY PARTICIPATION AND RIGHT TO WITHDRAW:

Your participation in this study is entirely voluntary: You choose whether to participate. If you decide not to participate, there are no penalties, and you will not lose any benefits to which you would otherwise be entitled. If you choose to participate in the study, you can stop your participation at any time, without any penalty or loss of benefits. If you want to withdraw from the study, please inform the student investigator, Keshrie Naidoo.

CONFIDENTIALITY:

We are collecting focus group interview data for research purposes only. We will not provide you or anyone else your specific responses. All data will be aggregated (i.e. we will combine your responses with the responses of all other participants). Data will be stored on Partners encrypted computers and behind the Partners firewall.

To compare your pre- and post-study survey responses, we will assign you a participant identification number. However, your response and feedback will be confidential and not linked back to your name in reporting.

We will begin the focus group by asking the participants to agree to the importance of keeping information discussed in the focus group confidential. In addition, we will ask each participant to verbally agree to keep everything discussed in the room confidential and will remind them at the end of the group not to discuss the material outside. The interview will be audio recorded and transcribed. All identifying information will be removed. We ask that you do not reveal identifying information about yourself and others in the group.

Any study records that identify you will be kept confidential to the extent possible by law. The records from your participation may be reviewed by people responsible for making sure that research is done properly, including members of the Johns Hopkins University Homewood Institutional Review Board and officials from government agencies such as the National Institutes of Health and the Office for Human Research Protections. (All of these people are required to keep your identity confidential.) Otherwise, records that identify you will be available only to people working on the study, unless you give permission for other people to see the records.

COMPENSATION:

You will not receive any payment or other compensation for participating in this study.

IF YOU HAVE QUESTIONS OR CONCERNS:

You can ask questions about this research study now or at any time during the study, by talking to or by calling the student researcher Keshrie Naidoo at 617-724-4848.

If you have questions about your rights as a research participant or feel that you have not been treated fairly, please call the Homewood Institutional Review Board at Johns Hopkins University at (410) 516-6580 or contact the Partners Human Research Committee at (857) 282-1900.

Appendix MM - Codebook for Mentee Focus Group Interview Data

Theme	Codes	Definitions
Foreign culture	Graduate school	Participants noted a drastic change from undergraduate education to graduate school and experienced difficulty navigating the foreign environment of a health sciences program.
	Environment	Participants described the challenge of moving to a new city with a unique culture and pace
Someone like me	Peers	Participants valued having peer mentors who had a shared minority experience and had successfully navigated the first year of the DPT program
	Faculty	Networking events provided important opportunities to interact with faculty outside of the classroom and highlight similarities between students and faculty
	Graduates	Participants valued hearing from alumni and alumni of color at networking events
	Shortage of minority role models	Participants noted some diversity in their peer groups but less so in the faculty and felt that there could be increased representation in the institution as a whole
Connection	Humility	Participants described that mentors had a willingness to learn about other cultures. Humility was seen as a pre-requisite for establishing the mentoring relationship.
	Invested	Faculty and peer mentors were seen as genuinely interested in mentee success and this contributed to establishing a trusting relationship and feeling connected to the institution. Time with faculty and peer mentors was seen as a valuable resource which contributed to feelings of connection to the institution.
	Informal	Less formal means of communication such as text messages contributed to mentors being accessible to mentees.
Future oriented	Differing foci	Participants noted that the networked mentoring model offered them differing perspectives. Peer mentors helped them deal with the current stressors of school and faculty mentors help them think about the future
	Paying it forward	Mentees hoped to serve as mentors in the future

Appendix NN - Codebook for Faculty Focus Group Data

Theme	Code	Description
Nurturing the relationship	Time investment	The time commitment and multiple touchpoints of networked mentoring contributed to the relationship developing quickly over a shorter period
	Groundwork	To strengthen the foundation of the mentoring relationship, faculty mentors made intentional decisions about physical meeting spaces, non-verbal communication, preparation, and word choice
	Shared experiences	Similar experiences as minorities or marginalized groups contributed to building the relationship but required vulnerability to nurture the relationship
	Value	Faculty mentors describe feeling needed particularly in times of crisis. It helped to establish a strong foundation for the mentoring relationship.
Vulnerability	Outside the comfort zone	Mentoring spaces and conversations about race, particularly with racially incongruent dyads, required that both faculty mentors and mentees step outside of their comfort zones
	Faculty risk taking	Faculty described early risk taking in questioning which required vulnerability to talk about race
	Student risk-taking	Students became empowered to speak about the minority experience outside of 1:1 meetings, in large classes with their peers as well
Opportunity to Learn	Individualized learning experience	Faculty developed an appreciation for the unique experience of minority students in higher education
	Barriers intake	The barriers that minority students face that may limit or alter their ability to engage with the learning experience
	Cross-cultural awareness	Faculty awareness of cultural differences resulted in decrease making of assumptions but also may have resulted in decreased confidence with cross-cultural interactions

Appendix OO - Codebook for Peer Mentor Focus Group Data

Theme	Code	Description
Community	Cohort model	Peer mentors felt that in their cohort of peers, described as cohesive, they had a community who they could depend on.
	Faculty Support	Supportive relationships with faculty who were approachable and accessible contributed to a sense of belonging in the institution
	Belonging	Peer mentors described feeling represented in the classroom with more racial and ethnic diversity than in previous cohorts, but noted a lack of representation of faculty of color both core and associated faculty (laboratory instructors)
Upward trajectory	Professional growth	Peer mentors described their learning experiences in the classroom and clinical environment as well as through the networked mentoring program
	Room to grow	Participants described that institution as having made progress during their time of study but described the institution as having potential to improve particularly in the domains of representation and cultural competence.
Empowered	Leveling the playing field	Mentors became aware that through mentorship they helped to level the playing field for the first-year minority mentees
	Power dynamic	Mentors felt that the lack of a power differential between peer mentors and mentees contributed to an open and honest relationship
	Reciprocity	Through participation in the networked mentoring program, peer mentors became aware of the bidirectional nature of mentoring
	Confidence	Mentors left the program with increasing confidence in their ability to mentor and voiced motivation to pursue future mentoring opportunities

Appendix PP – Keshrie Naidoo Curriculum Vitae

EDUCATION

Doctor of Education candidate (Specialization: Entrepreneurial Leadership in Education)		Johns Hopkins University School of Education Anticipated graduation August 2020
Transitional Doctor of Physical Therapy	2005	MGH Institute of Health Professions, Boston, MA
Master of Science in Physical Therapy (Specialization in Orthopedics)	2005	MGH Institute of Health Professions, Boston, MA
Bachelor of Science (Physiotherapy)	1998	University of Cape Town, South Africa

SPECIALIST CERTIFICATION

ABPTS Clinical Specialist in Orthopedic Physical Therapy	2009-2029
APTA Certified Clinical Instructor	2004

PROFESSIONAL LICENSURE

Massachusetts State License Number	16648

ACADEMIC APPOINTMENTS

Assistant Professor - Graduate Programs in Physical Therapy MGH Institute of Health Professions, Boston, MA	December 2012 – present
Director – Clinical Residency in Orthopaedic Physical Therapy	September 2015 – present
Massachusetts General Hospital Physical Therapy Services Neurologic Residency Faculty	August 2018-present

CLINICAL APPOINTMENTS

Bay State Physical Therapy – Quincy, MA Physical Therapist	November 2012- August 2017
Bay State Physical Therapy – Quincy, MA Clinical Manager	February 2006 - November 2012
Quincy Medical Center – Quincy, MA Per diem therapist Tertiary and Acute Care	October 2005 – March 2006
Massachusetts General Hospital – Boston, MA Staff physical therapist – Clinician	November 2003 – September 2005
Addington Hospital, Durban, South Africa Staff physical therapist	January 1999 – July 2001

PEER REVIEWED PUBLICATIONS

Naidoo K, Yuhaniak H, Abel Y, An Ecological Systems Approach to Exploring Facilitators and Barriers to Success for Minority Students Enrolled in a Doctor of Physical Therapy Program, *Health Professions Education*, https://doi.org/10.1016/j.hpe.2020.06.001

ABSTRACTS AND PROCEEDINGS

Naidoo K, Chatiwala N, Schumacher N. The comprehensive evaluation and treatment of an adolescent patient post concussive syndrome. *J Orthop Sports Phys Ther.* 2019; 49 (1): CSM187. doi:10.2519/jospt.2019.49.1.CSM154

PROFESSIONAL PRESENTATIONS

Peer reviewed:

Naidoo K, Plummer L, Clock, C. *Supporting Culturally and Linguistically Diverse Learners in a Doctor of Physical Therapy Program.* Platform presentation Educational Leadership Conference in Bellevue, WA. October 18, 2019.

Knox S, **Naidoo K,** Baldwin J, Schmidt C, Gross, KD, Westrick RB. *Development of Domains of Competence for Student Outcomes in a Doctor of Physical Therapy Program.* Platform presentation Educational Leadership Conference in Bellevue, WA. October 18, 2019.

Naidoo K, *Integrative Theory of Treatment and Logic Model for Networked Mentoring in Physical Therapy Education*. Poster presentation. Johns Hopkins School of Education 2019 Celebration of Research. Baltimore, MD. July 21, 2019

Naidoo, K. *An Ecological Systems Approach to Understanding Racial/Ethnic Minority Student Underrepresentation in Physical Therapy.* Platform presentation. 2019 Eastern Sociological Society Annual Meeting in Boston. March 14–17, 2019

Naidoo, K. *Facilitators and Barriers to Success in a Doctor of Physical Therapy Program.* Platform presentation. MGH Institute Research and Scholarship Day. Boston, MA. January 8, 2019.

Naidoo K, Chatiwala N, Schumacher N. *The comprehensive evaluation and treatment of an adolescent patient post concussive syndrome.* Poster presentation. APTA of MA Chapter Fall Conference, Norwood, MA October 2018.

Naidoo K, Alimi S, Costello M. *Scaffolding clinical education from integrated experiences to residency and beyond.* Educational session. APTA of MA Chapter Fall Conference, Norwood, MA. October 2018

Naidoo K, Andreyo E, Jensen L. *Utilizing patient outcomes and clinically meaningful change to assess the effectiveness of residency training*. Poster presentation. APTA Combined Sections Meeting. New Orleans, LA. February 2018.

Naidoo K, Chatiwala N, Pai T, Gray-Meltzer L. *Reasoning Out Loud: A workshop for clinical educators and students to apply the One-Minute Preceptor, SNAPPS and SNAPPS-Plus Frameworks.* Platform Presentation**.** APTA of MA Chapter Fall Conference October 2017

Naidoo K, Pai T, Gray-Meltzer L. *The One Minute Preceptor and SNAPPS: Learner centered models to maximize the teachable moment in the clinical environment***.** Platform presentation. APTA Combined Sections Meeting, San Antonio, TX February 2017.

Naidoo K, Baldwin J, Burns R. *Orthopaedic Residents as Mentors in the Doctor of Physical Therapy Service Learning Curriculum.* Poster presentation APTA of MA Chapter Fall Conference, Norwood, MA. November 2016

Naidoo K. *Peer Assisted Learning and the Collaborative Clinical Education Model: Strategies to Promote Student Success in the Cognitive, Affective and Psychomotor Domains.* Platform presentation APTA Combined Sections Meeting. Anaheim, CA. February 2016.

Naidoo K, Cesario C, Fitzgerald C. *Beyond a Social Network: An Information Network for the Health Care Professional: Moving from Information Recipient to Information Broker*. Platform presentation APTA of MA Chapter Fall Conference, Waltham, MA. November 2015

Naidoo K*. Evaluating the Effectiveness of Communication between the Academic Institution and the Clinical Site through Student Perception of the Integrated Clinical Experience*. Poster presentation APTA Education Leadership Conference, Baltimore, MD. October 2015.

Naidoo K, *Considerations for Pairing the Student Learning Dyad in a Collaborative Clinical Experience.* Poster presentation APTA Education Leadership Conference, Kansas City, MO. October, 2014.

Naidoo K, *The relationship between exercise and functional disability in the second and third trimesters of pregnancy.* Poster presentation APTA of MA Chapter Fall Conference. November, 2004.

AWARDS AND RECOGNITIONS:

2019
Educator Influencer Award at the Education Leadership Conference for abstract entitled 'Supporting Culturally and Linguistically Diverse Learners in a Doctor of Physical Therapy Program'

2019
Educator Influencer Award at the Education Leadership Conference for abstract entitled 'Development of Domains of Competence for Student Outcomes in a Doctor of Physical Therapy Program'

2019
Partners in Excellence Individual Award for Leadership and Innovation

2018
Special Recognition for Excellence in Research for abstract 'Use of a Concussion Clinical Trajectory Model for the Management of Post-Concussion Syndrome in an Adolescent Athlete: A Case Study' from APTA MA Chapter Conference 2018

2011
MGH Institute of Health Professions - Outstanding Clinical Educator Award

2003
The MGH Institute of Health Professions - Marjorie K. Ionta Award for Clinical Excellence